Kodak DryView 8150 LASER IMAGER

SERVICE MANUAL

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Revision History

The original issue and revisions of this Service Manual for the *Kodak DryView* 8150 LASER IMAGER are identified as follows:

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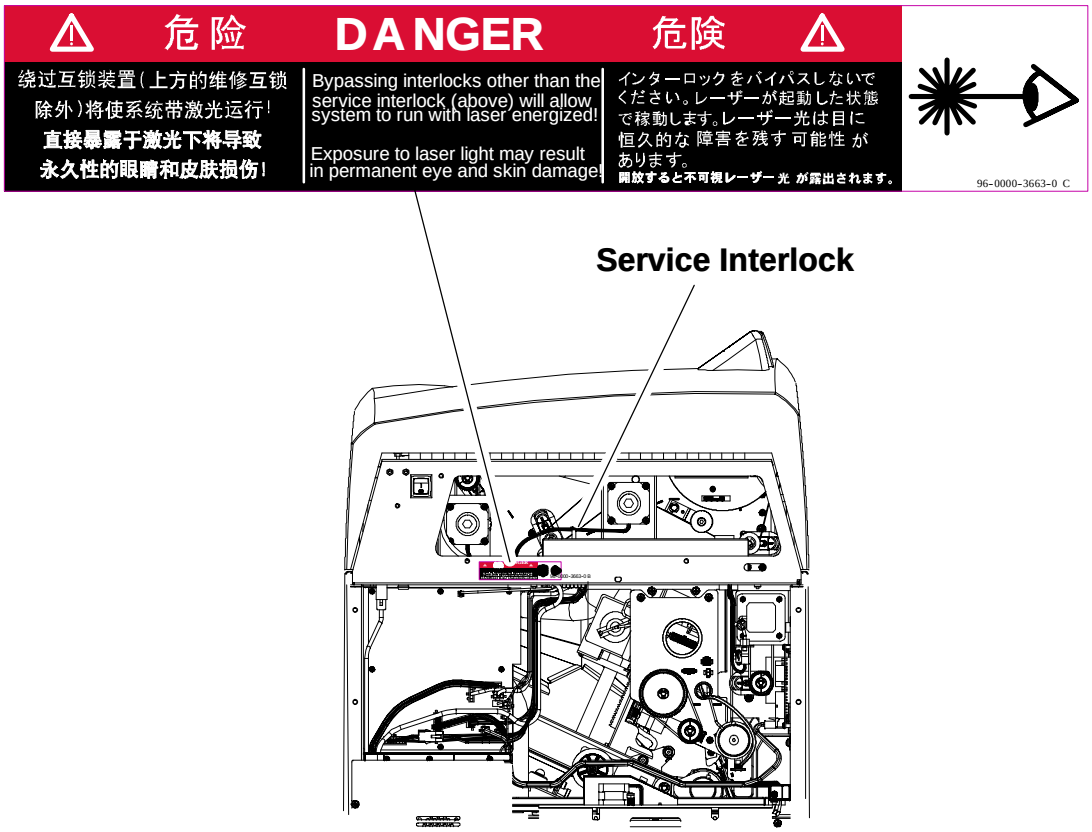
All pages are dated November, 2004 in the initial issue.

Section	Text Rev.	Pages Changed in Current Revision*
Title	B	–
Warnings	B	–
TOC	B	–
1	B	–
2	B	p4 added callout #10; p7 deleted fourth bullet and added a new bullet; p15 added step #9; p26 added Configuring SCP and added a Note; p32 revised Note text and deleted steps 2 – 5; p38 added overview and replaced screen image; p39 added step a; p40 replaced screen image; p41 replaced screen image; p42 revised Note and added step 29; p43 moved Training Key Operators to after Editing Service History; p44 deleted par 2–8.
3	B	p1 revised temperature spec; p4 revised steps 3 and 6; p6 revised screen image.
4	B	p1; p45 revised Caution.
5	B	p1 revised Note; p5 added procedure.
6	B	–
7	B	p3 added Problem, Cause, Remedy; p25 revised step; p31 added Reloading the MPDB; p70 added Using PCAnywhere; p71 revised heading to Using filtering and added Using Scripts.
8	B	p17 added 10.x.x.x Problem; p33 deleted Note; p35 revised step 7; p50 added Other Possible Causes; p51 revised Summary; p63 added Other Possible Causes and Film Pickup Suction Cup procedure; p69 added Other Possible Causes; p73 revised step 2; p81 added Other Possible Causes; p82 added step #3; p87 revised procedure; p88 revised procedure; p90 deleted Note; p92 deleted Note; p94 revised step 1.
9	B	p3 revised part number #16; p8 added callout #20; p9 added item #20; p10 ; p18 revised part number #6; p20 revised part number #13.
10	B	–
* New and revised text is marked by a change bar in the page margin.		

Safety, Regulatory, EMC and CE Marking Compliance

All Installation and User–related safety information (Warnings and Cautions), regulatory, EMC and CE marking information may be found in the Safety Manual for this device. Specific service–related warnings and cautions are included in this manual.

This device contains a 50 milliwatt LASER. The following label, visible when the REAR PANEL is removed, warns of danger if the LASER is energized when the rear panel is removed.


危 险
DANGER
危険
绕过互锁装置(上方的维修互锁除外)将使系统带激光运行!
直接暴露于激光下将导致永久性的眼睛和皮肤损伤!
Bypassing interlocks other than the service interlock (above) will allow system to run with laser energized!
Exposure to laser light may result in permanent eye and skin damage!
インターロックをバイパスしないでください。レーザーが起動した状態で稼動します。レーザー光は目に恒久的な 障害を残す 可能性 があります。
開放すると不可視レーザー光 が露出されます。
96-0000-3663-0 C
Service Interlock

⚠ WARNING

For continued protection against fire, replace fuses only with fuses of the same type and fuse rating.

PLEASE NOTE The information contained herein is based on the experience and knowledge relating to the subject matter gained by Eastman Kodak Company prior to publication.

No patent license is granted by this information.

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Caution

To avoid damage to ESD sensitive ELECTRONIC COMPONENTS, always wear an ANTI-STATIC WRIST STRAP when handling CIRCUIT BOARDS or EPROMs.

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Section 1 – Specifications

1-1. Dimensions

Unpacked:

Height: 116.8 cm (46 in.) – Top Cover closed
158.1 cm (62-1/4 in.) – Top Cover open

Width: 63.5 cm (25 in.)

Depth: 66.0 cm (26 in.) – Front Door closed
124.5 cm (49 in.) – Front Door open

Weight: 204 kg (450 lbs)

Packed:

Height: 145 cm (57 in.)

Width: 81 cm (32 in.)

Depth: 99 cm (39 in.)

Weight: 268 kg (590 lbs)

1-2. Electrical Power

Line-matching is accomplished by the use of VOLTAGE SELECTION PLUGS inserted at the primary of the POWER TRANSFORMER.

Input Voltage:

- 100 VAC ± 10%, 50/60 ± 3 Hz
- 120 VAC ± 10%. 60 ± 3 Hz
- 230 VAC ± 10%, 50 ± 3 Hz

Input Current Draw:

- Less than 12 Amps at 100 VAC input voltage
- Less than 10 Amps at 120 VAC input voltage
- Less than 5.3 Amps at 230 VAC input voltage

Power Consumption: 700 watts maximum

1-3. Storage Environment

Temperature: –35° to 60°C (–31° to 140°F)

Humidity: 10% to 90% RH, Noncondensing

1-4. Operating Environment

Temperature: 15° to 35°C (59° to 95°F)

Humidity: 15% to 85% RH, Noncondensing

Magnetic Field: 50 Gauss (maximum)

1-5. Altitude

–30.5 m (100 ft) below sea level to 3,050 m (10,000 ft) above sea level

1-6. Floor Vibration

The IMAGER shall operate with no image degradation with floor vibration levels up to:

- 1×10^{-7} G^2/Hz at a frequency range of 1–50 Hz in the vertical or horizontal direction
- 6×10^{-5} G^2/Hz at a frequency range of 50–200 Hz in the vertical or horizontal direction
- 5×10^{-6} G^2/Hz at a frequency range of 200–650 Hz in the vertical or horizontal direction
- 1×10^{-6} G^2/Hz at a frequency range of 650–1000 Hz in the vertical or horizontal direction

1-7. Floor Levelness

The floor must be level within 1° with respect to gravity vector direction.

1-8. Floor Load

100 lb/sq in. , calculated by dividing machine weight by machine floor “foot print” (450 lb/4.5 sq ft).

1-9. Environmental Effects

Heat Dissipation: 3000 BTU/Hr (average)

Acoustical Noise: Less than 55 dB-A at 1 meter (less than 70 dB momentarily)
Less than 80 dB-A at 1 meter for non-repetitive tasks such as door open/close

1-10. Film Size

The *Kodak DryView* 8150 LASER IMAGER will process *Kodak DryView* LASER IMAGING FILM in the following sizes:

- 35 x 43 cm
- 35 x 35 cm
- 11 x 14 in.

1-11. Film Throughput

Up to 70 films per hour

1-12. Image Input Options

DICOM Network Interface

1-13. Glossary

Following are definitions of abbreviations and technical terms used in this manual.

ACK	Acknowledge – A hardware signal (response) that indicates reception of a signal.
A/D	Analog to Digital – The conversion of an analog signal to digital format.
ADC	Analog to Digital Converter – The hardware circuit that converts analog to digital format.
AIQC	Automatic Image Quality Control – The subsystem in the laser imager consisting of hardware and software that ensures consistent image quality.
API	Application Programming Interface – The Library and Tools software that handles video parameters, and mediates differences between CHP file parameters and MIB video variables.
BOM	Beginning of Message
Browser	A computer program that accesses and displays information from the web. It contains multiple application programs, and uses an object's name (URL) to determine which application should be used to access the object.
Carrier Profile	A term categorizing a subset of video parameters that describe the video signal itself as opposed to the image content carried on the video signal.
CGI	Common Gateway Interface
COM	Communications (Port)
CPU	Central Processing Unit – The microprocessing chip in a computer.
DAC	Digital to Analog Converter
DICOM	Digital Imaging and Communications in Medicine
DLogE	Density versus the Log of Exposure
DMA	Direct Memory Access
Dmax	Maximum Density – Greatest possible image density, i.e., the density of the black step of the gray scale.
Dmin	Minimum Density – The measured density of film base plus fog. (Can be referenced either to the film or the image.)
Dpatch	Density patch – A patch of density 1.0 on the top border of the film.
DRE	DICOM Raster Engine
DUART	Dual Universal Asynchronous Receiver/Transmitter
ECC	Error Correction Code
EPROM	Erasable Programmable Read-Only Memory
EMC	Electromagnetic Compatibility
EOM	End of Message
EOT	End of Transmission
EU	European Union
FIFO	First In, First Out

FPGA	Field Programmable Gate Array
FRDONE	FIFO Read Done
FREAD	FIFO Read
FRGNT	FIFO Read Grant
FRR	FIFO Read Request
FTP	File Transfer Protocol
FWDONE	FIFO Write Done
FWGNT	FIFO Write Grant
FWR	FIFO Write Request
Gateway	A hardware device that links one network with another and translates data if the networks have different communication formats.
GSM	Grayscale Manager
HPT	Host Protocol Translator
HTML	HyperText Markup Language – The source language used for documents on the web. It embeds commands that determine formatting along with the text to be displayed.
HTTP	HyperText Transport Protocol – The protocol used to transport a page from one host to another on the web.
H/W	Hardware
Hypertext	A set of documents in which the documents contain embedded references to other documents in their text.
Image Profile	A term categorizing a subset of video parameters that describe the image content of the video signal.
I/O	Input/Output
IP Address	Internet Protocol Address – The numeric address of a site on the network, e.g., 163.228.42.82. An IP address is actually a 32-bit binary number. For convenience, the number is expressed in *dotted decimal notation*, which expresses each 8-bit section of the 32-bit number as a decimal value, and uses periods to separate the four sections. For example: 10000001 00110100 00000110 00000000 (binary) is expressed in dotted decimal as 129 . 52 . 6 . 0
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LUT	Lookup Table
MCS	Machine Control System – The subsystem in the IMAGER that controls the printing process.
MPC	Maintenance Personal Computer
OMBC	Optics Module Control Board
PAL	Programmable Array Logic
PCI	Peripheral Component Interconnect

PCIO	Peripheral Component Input/Output
PLL	Phase-Locked Loop
PPP	Point-to Point-Protocol
PTADR	Pass-through Address
PTATN	Pass-through Attention
PTDONE	Pass-through Done
PTGNT	Pass-through Grant
RAM	Random Access Memory
RDFIFO	Read FIFO
REQ	Request
RET	Retransmit
RF	Radio Frequency
RSET	Register Set – The set of registers in the API Library software that stores video parameters.
RTD	Resistive Thermal Device
RXD	The “receive” signal line, as defined by the RS232 and RS422 communication specifications.
TFT	Transfer Function Table
TTL	Transistor to Transistor Logic
TXD	The “transmit” signal line, as defined by the RS232 and RS422 communication specifications.
SMPTE	Society of Motion Picture and Television Engineers
SOL	Start of Line
SOS	Start of Scan
SSR	Solid State Relay
STP	Shielded Twisted Pair
Subnet Mask	A 32-bit value (in the format of an IP address) that specifies which bits of an IP address specify the host. For example: 255.255.0.0 masks the network portion of the address (255 = all 1’s). See IP Address for a description of address formats.
TCP/IP	Transmission Control Protocol/Internet Protocol
TPU	Time Processing Unit
UART	Universal Asynchronous Receiver Transmitter
URL	Uniform Resource Locator – A web address that locates a particular page on the web.
UTP	Unshielded Twisted Pair
WR	Write
WRFIFO	Write FIFO
WWW	World Wide Web

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Section 2 – Installation

2-1. Checklist of Installation Procedures

Following is a checklist of the procedures required during installation of an IMAGER:

❑ Uncrating and Initial Setup . . . . . Paragraph 2-3
❑ Unpacking . . . . . Paragraph 2-4
❑ Connecting to Electrical Power and the Network . . . . . Paragraph 2-5
❑ Configuring the IMAGER . . . . . Paragraph 2-6
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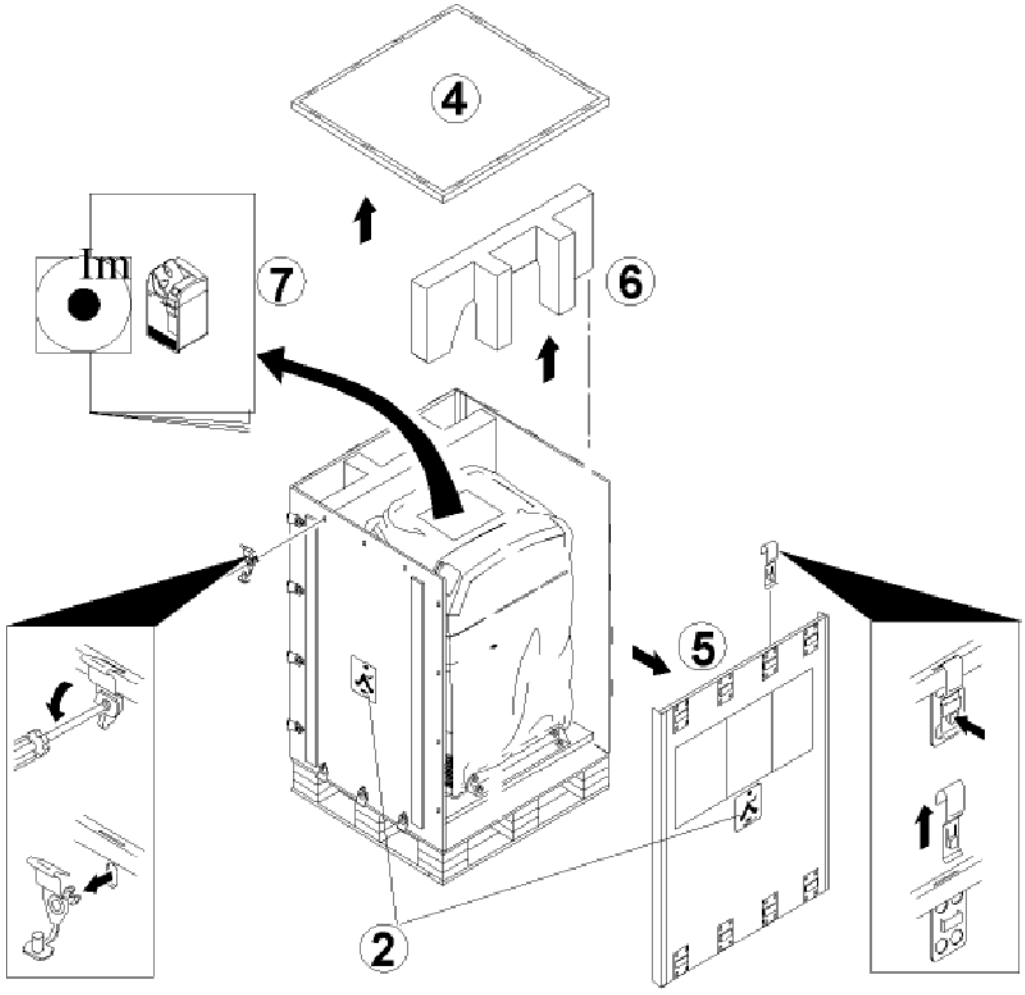
❑ Checking Temperature of the PROCESSOR . . . . . Paragraph 2-8
❑ Checking Image Quality . . . . . Paragraph 2-9
❑ Backing up the System Configuration . . . . . Paragraph 2-10
❑ Editing the Service History Log . . . . . Paragraph 2-11

2-2. Tools Required for Installation

- VOLTMETER
- LAPTOP COMPUTER
- SERVICE TOOL (Service WebLink software installed on your LAPTOP COMPUTER)

2-3. Uncrating and Initial Setup

2-3-1. Opening the Shipping Crate

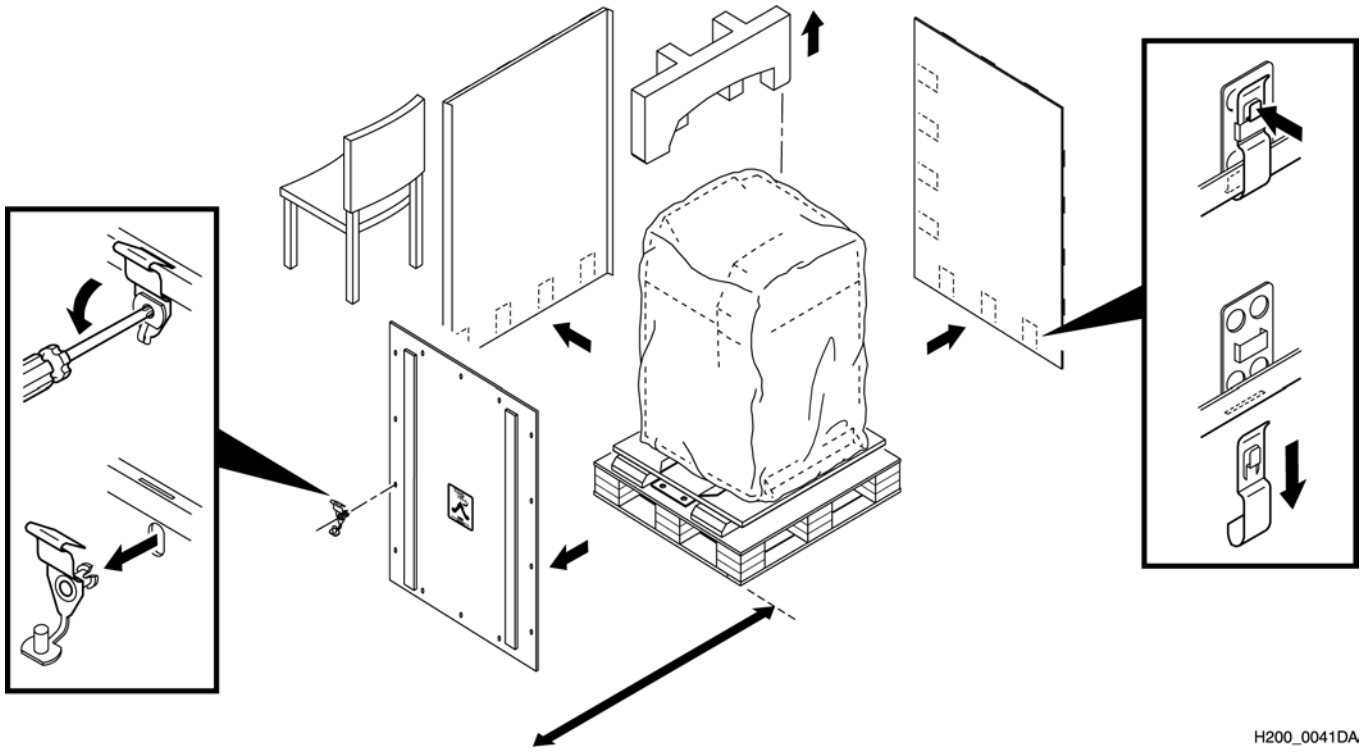


1. Inspect the SHIPPING CRATE for damage.
2. Check the 2 “Tip N’ Tell” SHIPPING MONITORS for possible mishandling during shipment.
3. If damage or mishandling is evident, contact the shipper.
4. Remove the TOP PANEL: 3 PLASTIC CLAMPS. 11 METAL CLAMPS.
5. Remove RIGHT SIDE PANEL: 4 PLASTIC CLAMPS, 8 METAL CLAMPS.
6. Remove the top FOAM PACKING.
7. Remove the PLASTIC BAG containing the printed *Kodak DryView* 8150 LASER IMAGER SAFETY MANUAL and the *Kodak DryView* 8150 LASER IMAGER USER DOCUMENTATION CD.
8. Read the SAFETY MANUAL.

2-3-2. Completing the Uncrating

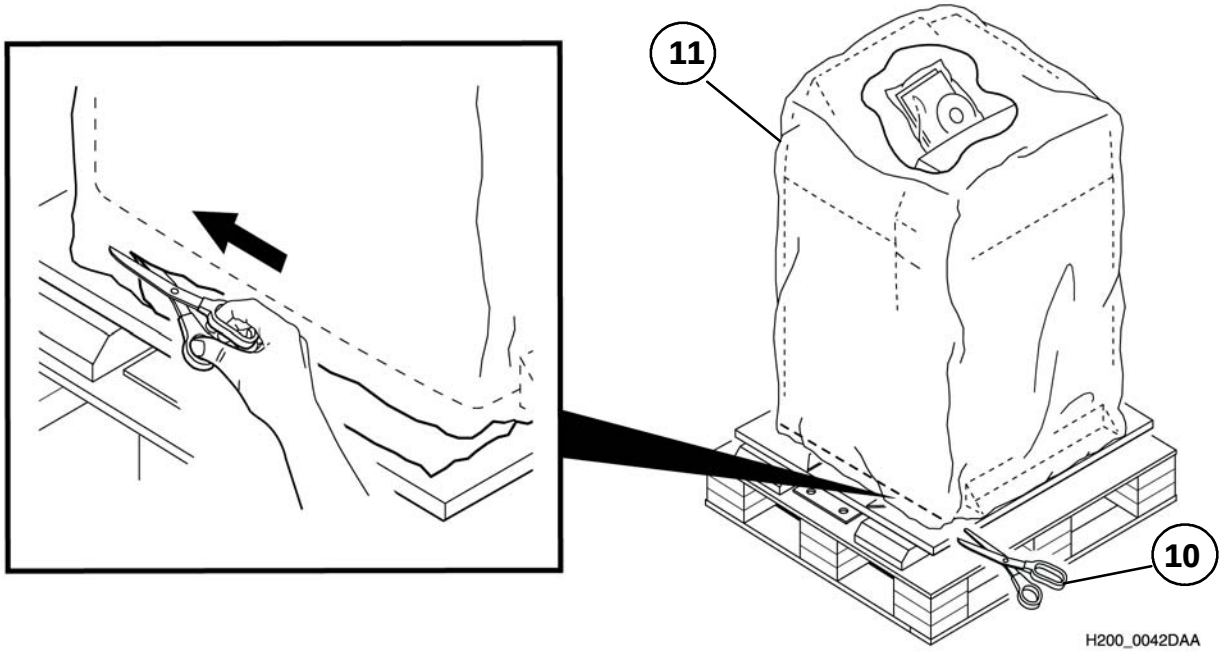
Important

Before completing the uncrating, check that there is an unobstructed space of 3 m (10 ft) in front of the crate.



1. Use a SCREWDRIVER to pry out and remove the PLASTIC CLAMPS remaining on the FRONT PANEL.
2. Lay the FRONT PANEL on the floor in front of the IMAGER.
3. Remove the METAL CLAMPS from the bottom of the SIDE PANEL.
4. Remove the METAL CLAMPS from the bottom of the REAR PANEL.
5. Place a chair or similar item against the SIDE PANEL to keep it from falling.
6. Hold the REAR PANEL so it does not fall. Remove the METAL CLAMPS from the edge of the REAR PANEL.
7. Remove the REAR PANEL and set it aside.
8. Remove the SIDE PANEL and set it aside.
9. Remove the FOAM PACKING.

10. With SCISSORS, cut the FOIL BAG all around the base of the IMAGER.

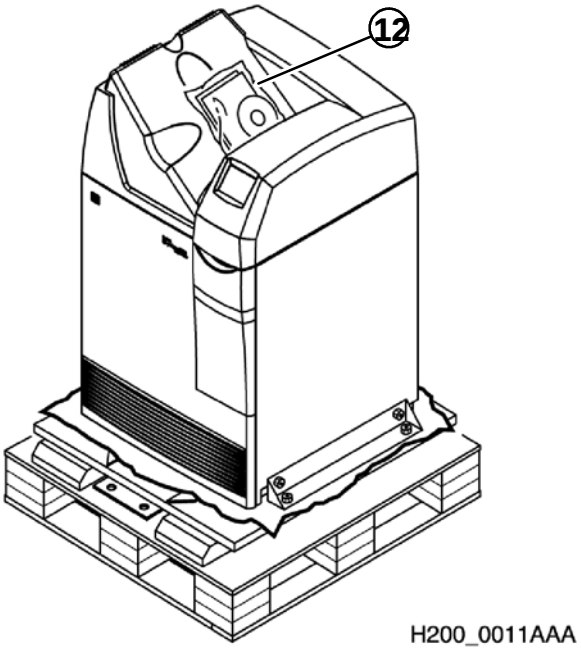


11. Remove the FOIL BAG.

Note

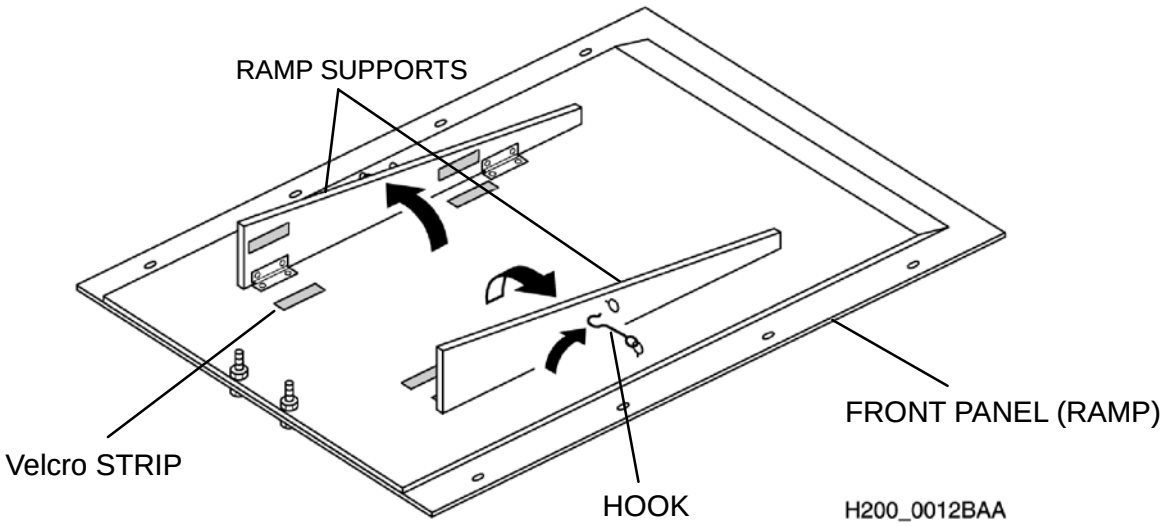
The bottom of the FOIL BAG, under the Imager, will remain in place.

12. Remove the ACCESSORIES package. See page 2-7 for contents.

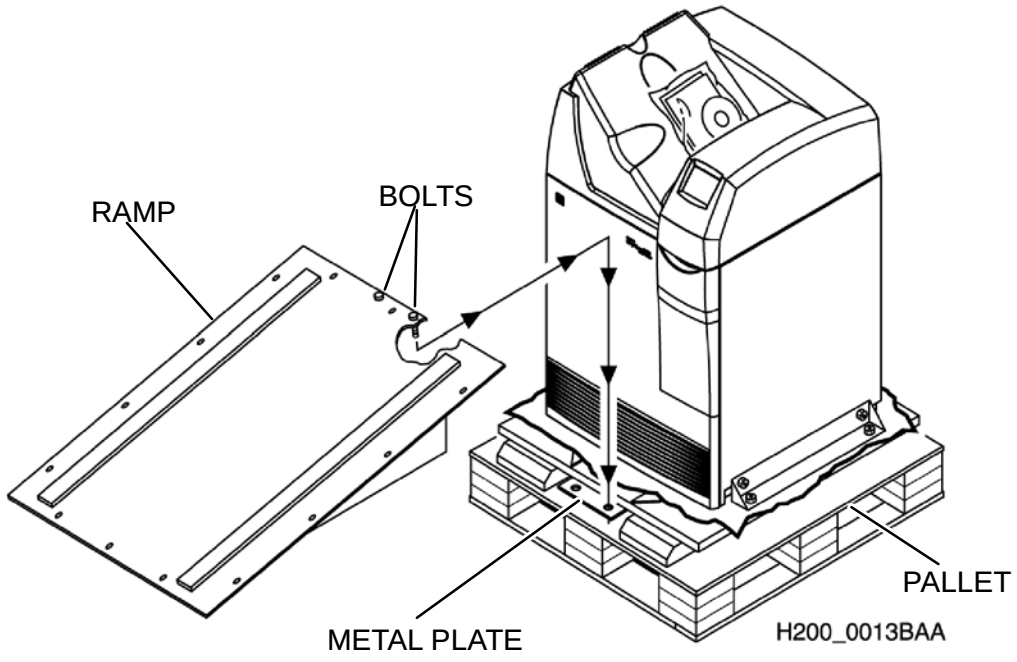


2-3-3. Removing the LASER IMAGER from the PALLET

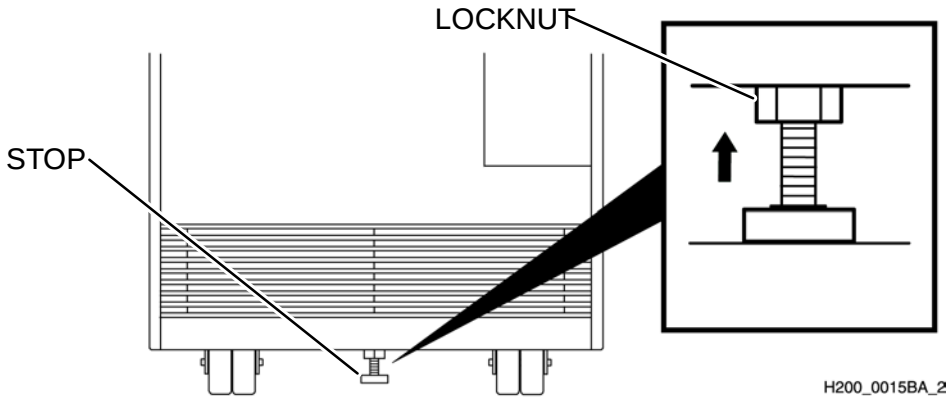
1. Prepare the FRONT PANEL of the SHIPPING CRATE to be used as a RAMP.
   a. Detach the 2 RAMP SUPPORTS from the *Velcro* STRIPS.
   b. Hook the RAMP SUPPORTS in the upright position.



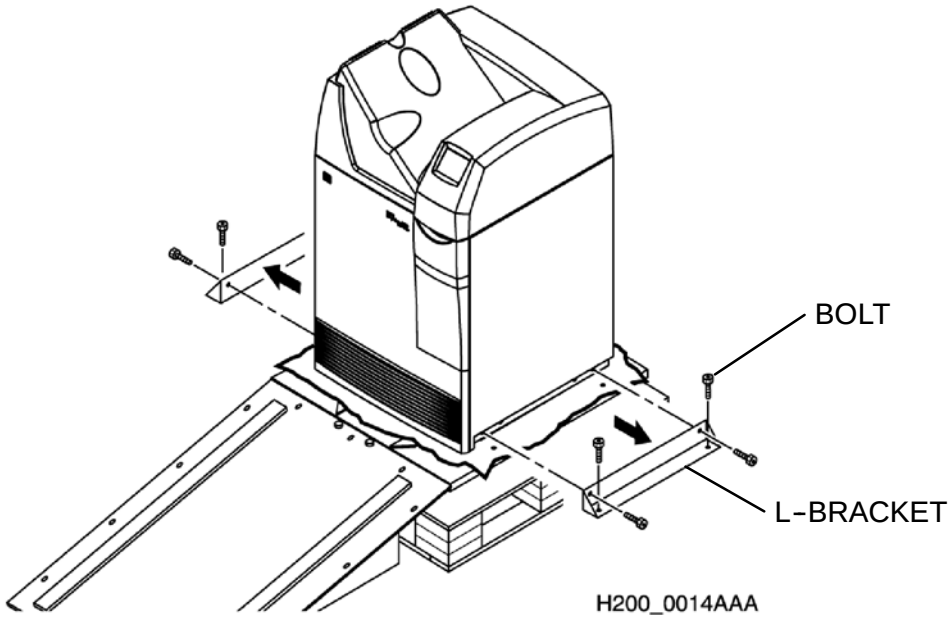
2. Turn the RAMP over.
3. Position the RAMP so the 2 BOLTS in the base of the RAMP insert into the holes in the METAL PLATE on the PALLET.



4. Check that the STOP is all the way up. If not, loosen the LOCKNUT and adjust the STOP up as far as possible.



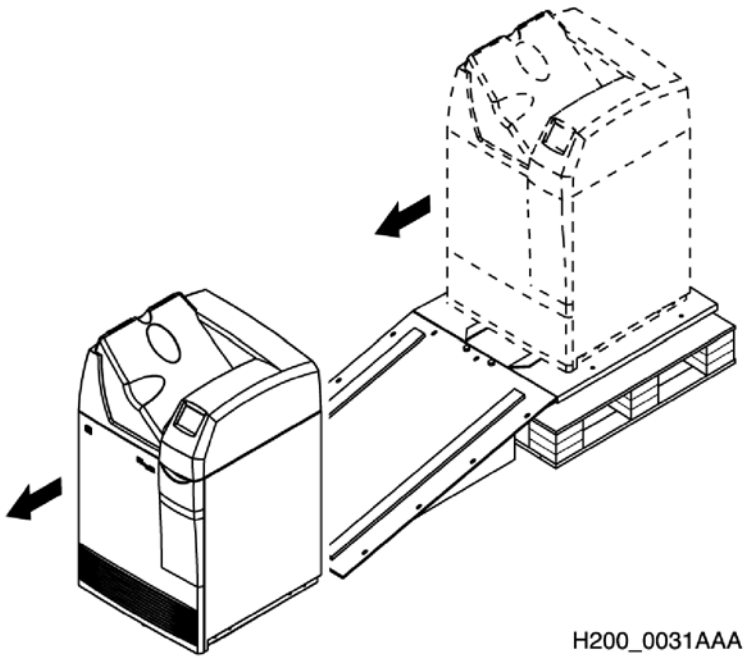
5. On each side of the IMAGER:
   a. Use the Allen WRENCH from the ACCESSORIES PACKAGE to remove 4 BOLTS from each L–BRACKET.
   b. Discard the BOLTS and L–BRACKETS.



Caution

Stand in front of the IMAGER as you control its movement down the RAMP. The force of the IMAGER down the RAMP is about 36 kg (80 lb). Be careful not to tip the IMAGER or allow it to roll off the side of the RAMP. The IMAGER weighs 204 kg (450 lb).

6. Move the IMAGER slowly down the RAMP.



2-3-4. Checking the Accessory Materials

Check that the following materials are included in the ACCESSORIES PACKAGE:

- A bag of 5 VOLTAGE SELECTION PLUGS – You will install one of the PLUGS in the IMAGER POWER SUPPLY to adapt the IMAGER to the AC source power at this customer site.
- 3 POWER CORDS – You will select the required CORD from the following:
  - A North American CORD SET with 3–prong PLUG
  - A Chinese CORD SET with PLUG
  - A “universal” POWER CORD – An appropriate PLUG must be connected on this CORD before it can be used.
- Two RJ-45 INTERNET DROP CABLEs – You will use one of these cables to connect the IMAGER to the DICOM network. There is a long CABLE and and a short CABLE. You can use either one.
- Software and publication CDs, including:
  – the user documentation CD
  – the DRE software CD
  – the Local Panel videos CD

Note

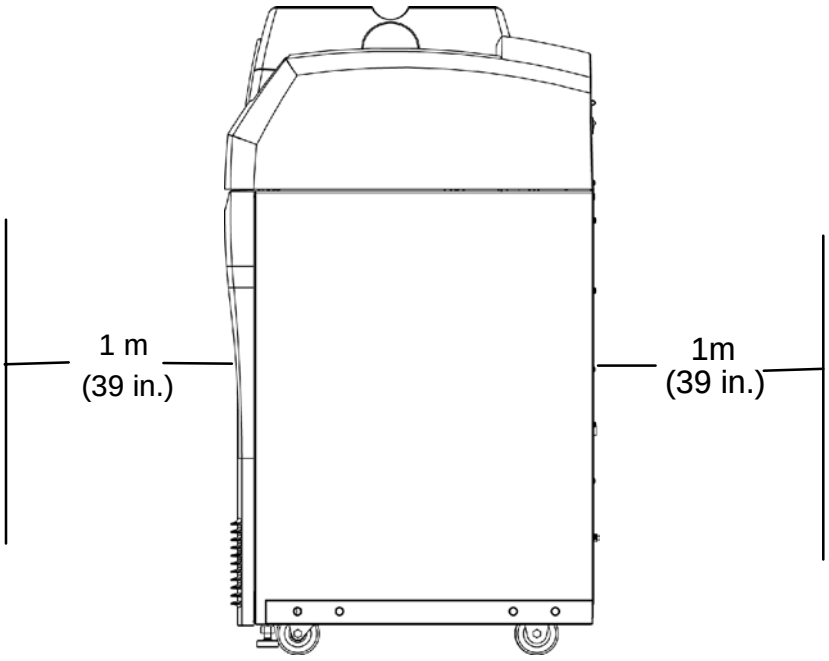
You have already removed and used the Allen WRENCH supplied in the ACCESSORIES PACKAGE. The USER DOCUMENTATION COMPACT DISK (CD) contains translated versions of the following manuals in many languages: SITE–READINESS CHECKLIST, USER GUIDE, INSTALLATION GUIDE, and SAFETY MANUAL.

Important

You should have read the SAFETY MANUAL by now. If not, please read it now.

2-3-5. Moving the IMAGER to the Installation Site

1. Move the IMAGER and accessories to the installation area.



2. Position the IMAGER temporarily so there is a space of a least 1 m (39 in.) in the front and at the back of the machine for removal of packing materials.

2-3-6. Checking Site Readiness

Check that the site is ready for installation of the IMAGER. Site Requirements are specified in the SITE READINESS CHECKLIST for the *Kodak DryView* 8150 LASER IMAGER, 7F3336. The requirements include:

- Location Requirements.
- One of the following AC power sources. within 2.5 m (8 ft) of the left rear corner of the IMAGER:
  - 100 V AC ± 10%, 50/60 Hz ± 3 Hz
  - 120 V AC ± 10%, 60 Hz ± 3 Hz
  - 230 V AC ± 10%, 50 Hz ± 3 Hz
- A network connection for a single modular RJ-45 plug within 8 m (26 ft) of the right rear corner of the IMAGER.
- Film of the correct size and type supplied by the customer.

2-3-7. Required Configuration Information

Check that the following customer information is available for configuration of the IMAGER:

- The Network (Host) Name for the IMAGER
- The Network Address for the IMAGER, including:
  - IP Address
  - Subnet Mask
  - Gateway
- The DICOM Port Number for the IMAGER
- A list of all MODALITIES that will connect to the IMAGER. For each MODALITY the list should include:
  - Manufacturer
  - Modality Type (CR, DR, etc.)
  - Model Name
  - Film type to be used
  - Film size to be used
- The following information is required for installation of RMS:
  - Customer Name
  - Customer Department
  - Region
  - Country
  - Location

  The following are the same as provided for the Network Configuration:
  - Node name
  - IP Address
  - Subnet Mask
  - Gateway

Continued

- Proxy Server Address[1]
- Proxy Server Port[1]
- Authentication Type[1]
- Proxy Server Username[1]
- Proxy Server Password[1]

[1] Required if used at location

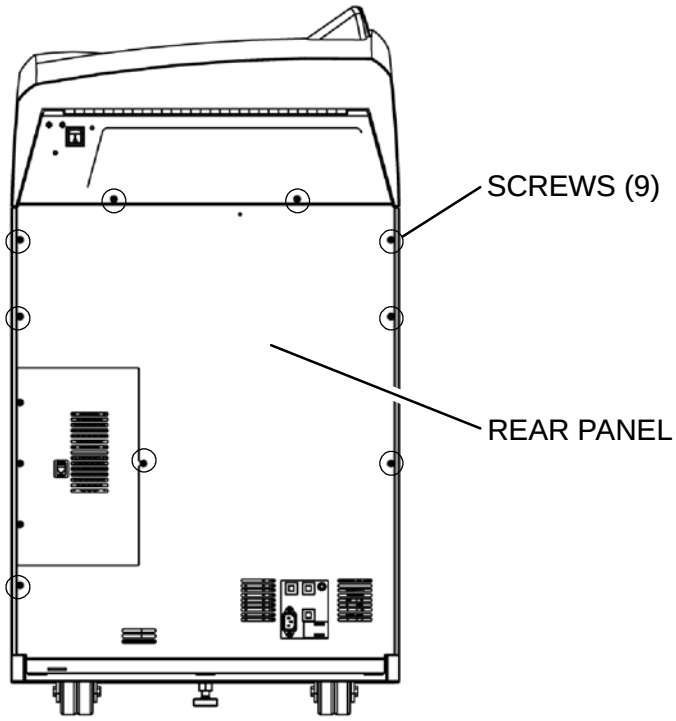
The following are obtained from the Imager during installation:

- K–number (found on Local Panel System Information screen)
- Serial Number (under the hood on the front of the Imager)

2-4. Unpacking

2-4-1. Removing the Packing Materials from the Back of the IMAGER

1. Remove and save 9 SCREWS, circled in the diagram, from the REAR PANEL.

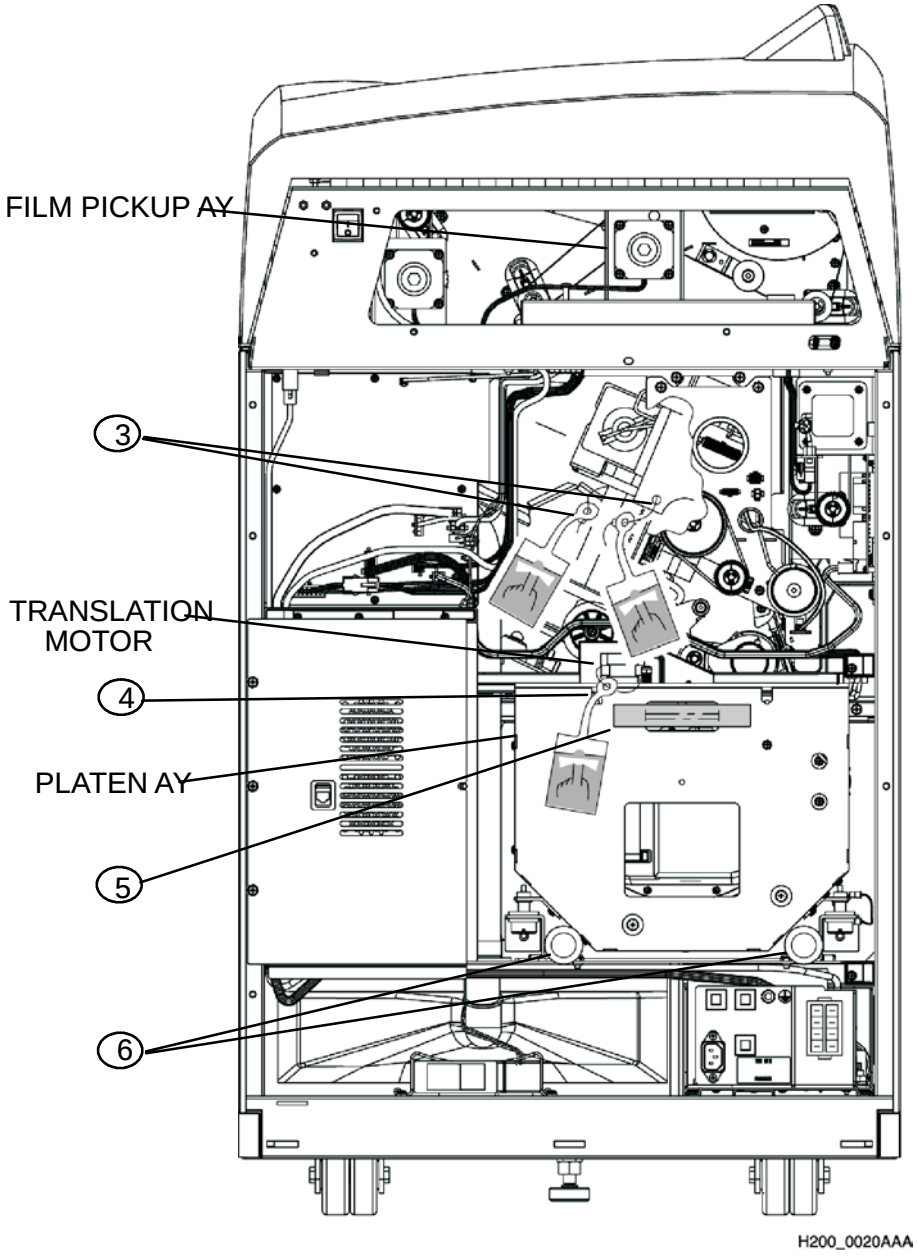


2. Remove the REAR PANEL.

Caution

CABLE TIES were installed in the IMAGER to restrain movable assemblies during shipment. When instructed to cut and remove a CABLE TIE, make sure that you remove the entire plastic CABLE TIE, to avoid damage to the IMAGER. Take care not to cut any WIRES or damage any mechanical parts or assemblies.

3. Cut and remove 2 CABLE TIES and TAGS from the FILM PICKUP AY.
4. Cut and remove the CABLE TIE and TAG from the TRANSLATION MOTOR.
5. Remove the TAPE and FOAM from the top of the PLATEN AY.
6. Pull out the 2 PLASTIC TUBES.

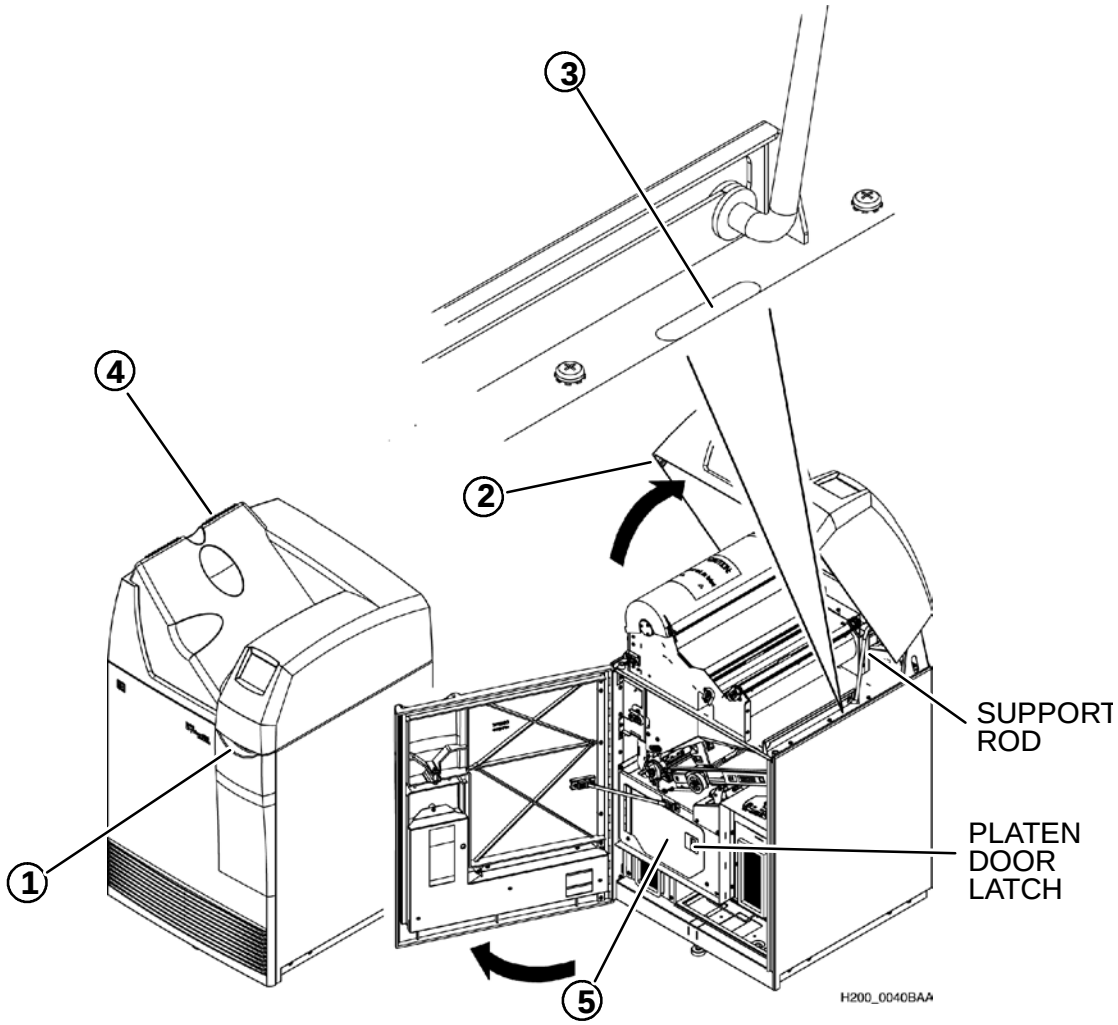


2-4-2. Removing the Packing Materials from the Front of the IMAGER

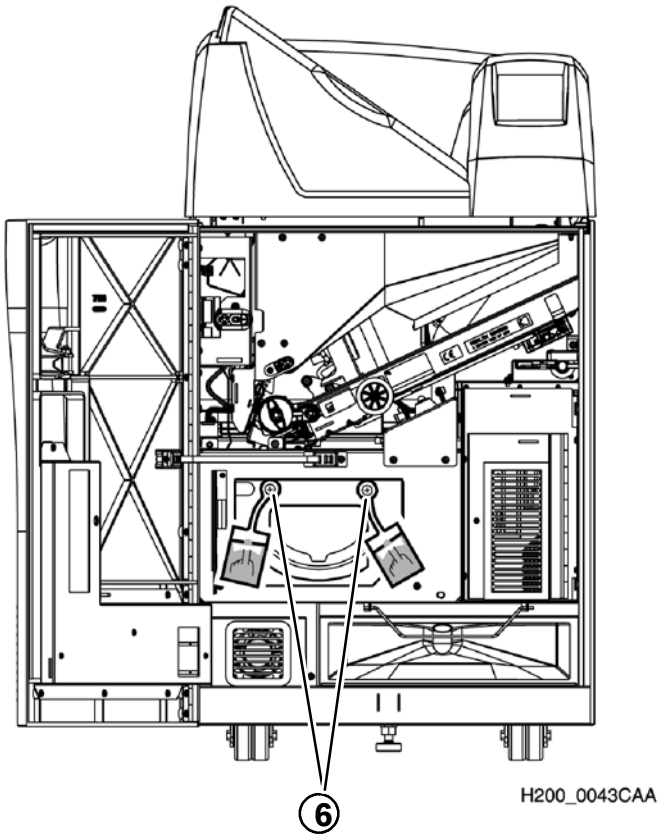
Caution

Whenever you raise or lower the HOOD, grasp the HOOD only in the area of the recessed slot below the LOCAL PANEL to avoid the possibility of pinching your fingers. Close the HOOD carefully. Releasing and dropping the HOOD could damage the IMAGER.

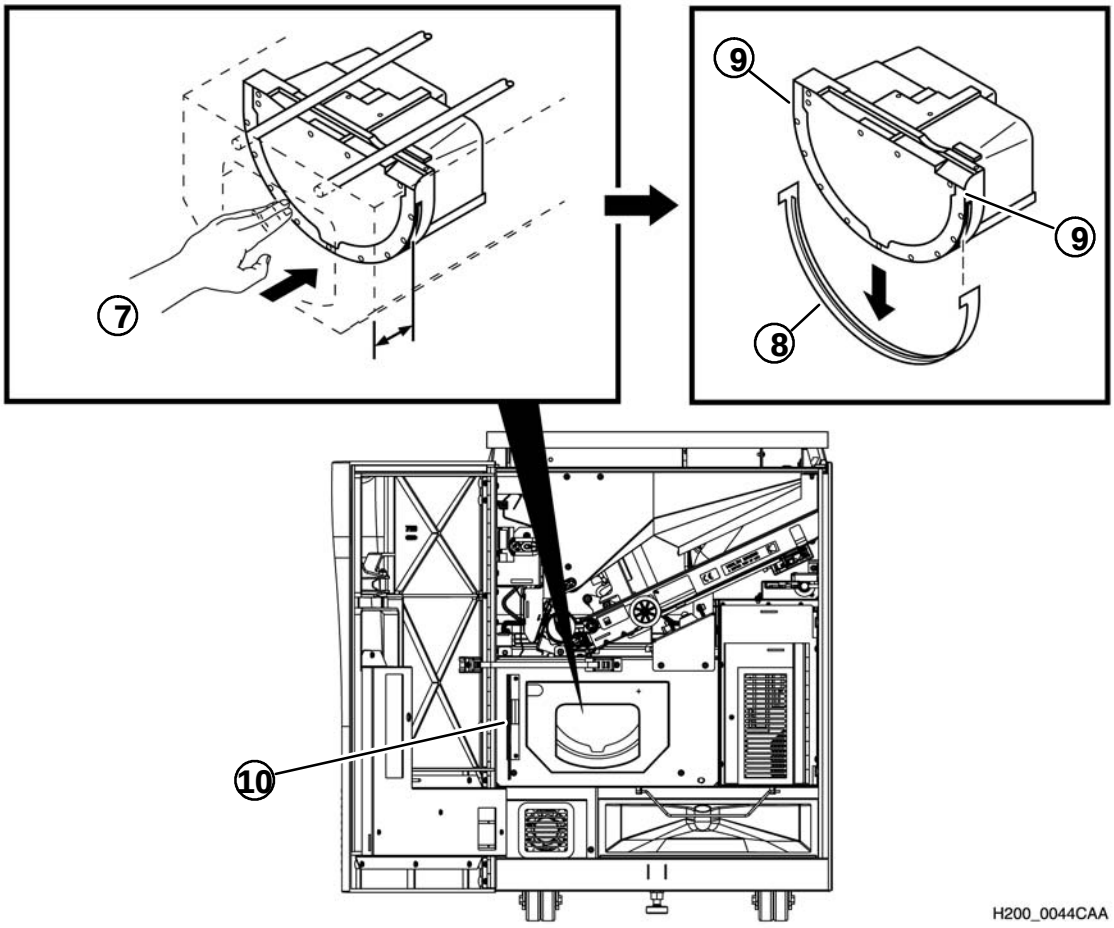
1. Grasp the HOOD in the recessed area below the LOCAL PANEL.
2. Raise the HOOD until the SUPPORT ROD locks into place.
3. Insert a small–diameter SCREWDRIVER or similar item in the slot at an angle, pointing toward the rear of the IMAGER. Press down to unlatch the FRONT DOOR.
   The DOOR will unlock and open
4. Close the HOOD.
5. Unlatch and open the PLATEN DOOR.



6. Remove the 2 SCREWS and 2 TAGS.



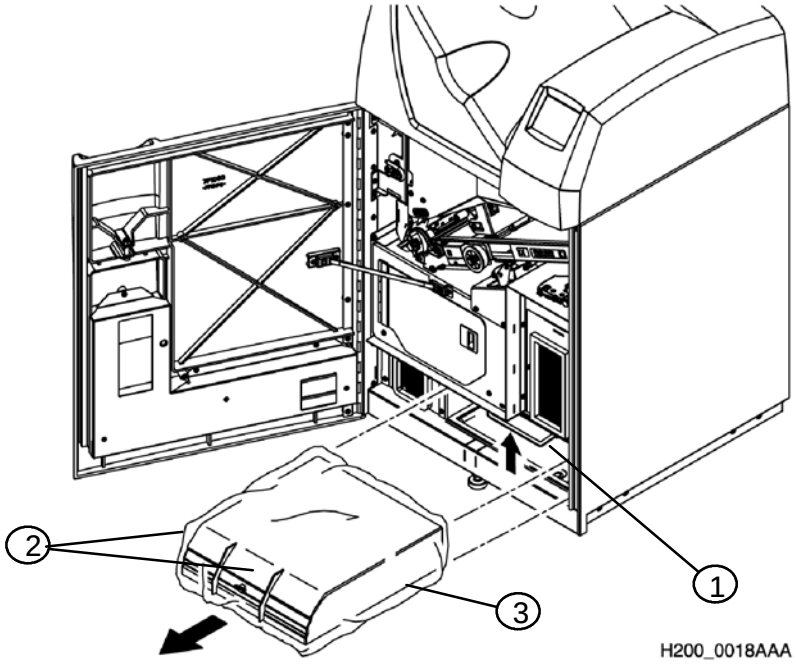
7. Reach through the PLATEN opening and slowly and steadily push the OPTICS MODULE back about 10 cm (4 inches). the OPTICS MODULE moves on RAILS.



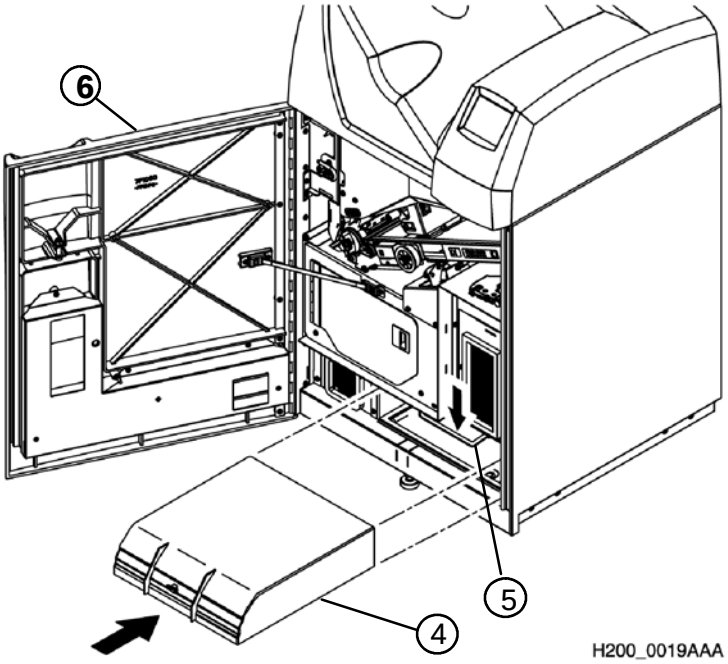
8. Reach in through the PLATEN opening and remove the RUBBER STRIP from the slot in the bottom of the OPTICS MODULE. Grasp the tab on either end of the RUBBER STRIP and peel the strip off.
9. Check that the double back tape, used to secure the RUBBER STRIP, is still attched to the strip. If not, go to step 10, otherwise step 11.
10. With your fingers, check both ends of the slot to make sure that no TAPE remains over the slot. Remove any remaining tape before proceeding. Tape left on this slot will cause horizontal banding near the edge of the film.
11. Close the PLATEN DOOR.

2-4-3. Installing the CHARCOAL FILTER

1. Lift the FILTER RETAINING CLIP.
2. Pull the PLASTIC BAG and the CHARCOAL FILTER from the IMAGER.
3. Remove and discard the PLASTIC BAG.



4. Insert the CHARCOAL FILTER into the enclosure.
5. Push down the RETAINING CLIP so it locks into place.



6. Close the FRONT DOOR.

2-4-4. Checking that Unpacking is Complete

Caution

If all packing materials are not removed from the IMAGER as instructed on the preceding pages, the IMAGER will be damaged when power is applied.

1. Check that you have removed from the back of the IMAGER:
   - 2 PLASTIC TUBES from the bottom of the PLATEN AY (see page 2-12)
   - TAPE and FOAM from the top of the PLATEN AY (see page 2-12)
   - One CABLE TIE and TAG from the TRANSLATION MOTOR (see page 2-12)
   - 2 CABLE TIES and TAGS from the FILM PICKUP AY (see page 2-12)
2. Check that you have removed from the front of the IMAGER:
   - 2 SCREWS and TAGS from the PLATEN AY (see page 2-14)
   - RUBBER STRIP from the slot in the OPTICS MODULE (see page 2-15)
   - PLASTIC BAG from the CHARCOAL FILTER (see page 2-16)
3. Close the FRONT DOOR.
4. Discard the packing materials.

2-5. Connecting to Electrical Power and the Network

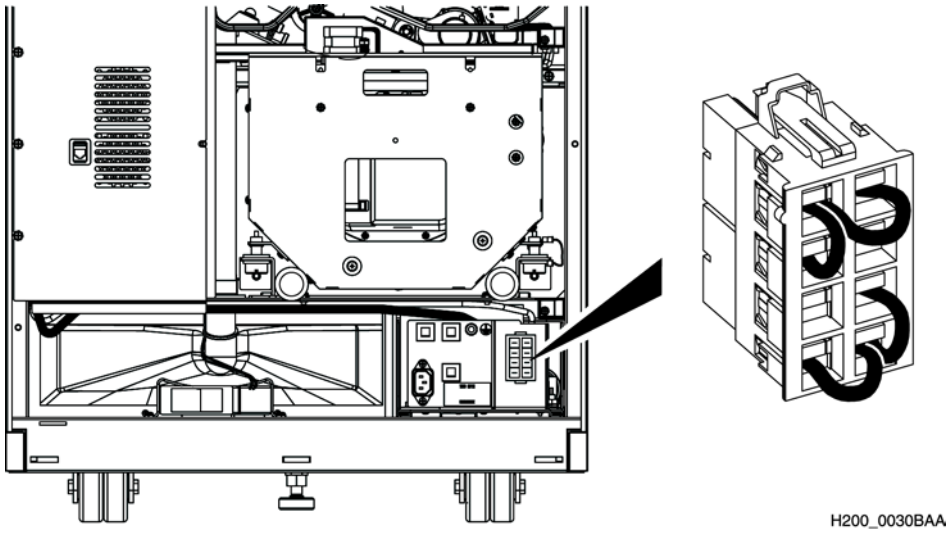
2-5-1. Electrical Power Setup

1. Use a VOLTMETER to measure the AC voltage at the wall outlet that will be used by the IMAGER.
2. From the bag of 5 VOLTAGE SELECTION PLUGS supplied in the ACCESSORIES PACKAGE, select the PLUG that matches the measured wall voltage:

For Measured Voltage of:	Select PLUG with:
90 – 105 V AC	Brown Wires
106 – 130 V AC	Red Wires
180 – 210 V AC	Orange Wires
211 – 230 V AC	Yellow wires
231 – 250 V AC	Blue Wires

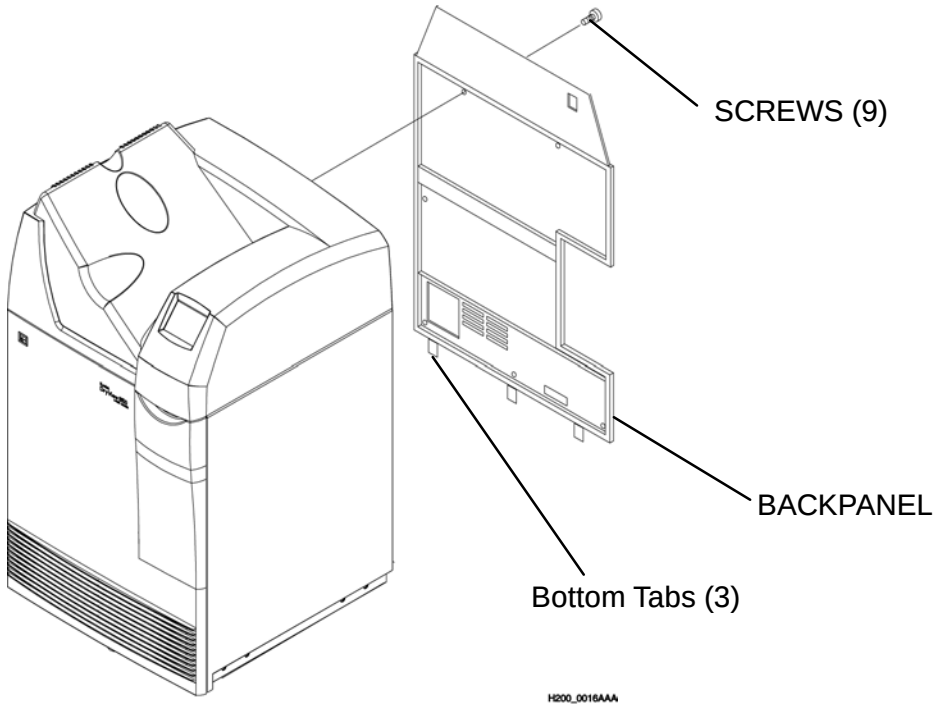
3. Insert the correct VOLTAGE SELECTION PLUG into the POWER SUPPLY.

   The VOLTAGE SELECTION PLUG is keyed so that it can only be inserted one way. Do not force the PLUG. When oriented correctly, it will insert easily.



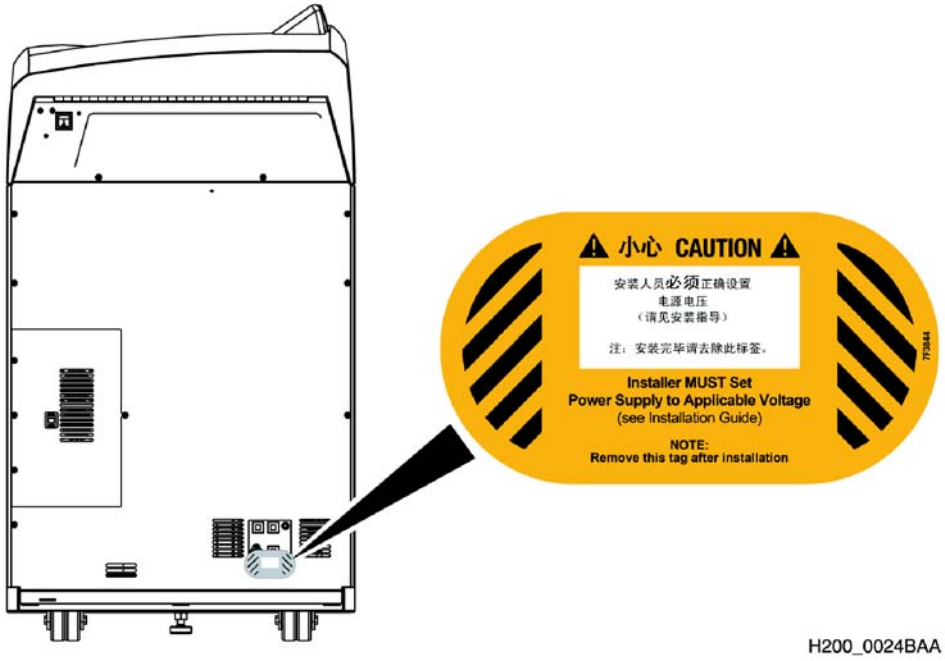
H200_0030BAA

4. Discard the remaining VOLTAGE SELECTION PLUGS.
5. Replace the REAR PANEL:
   a. Engage the bottom tabs and rotate the top into position.
   b. Install the 9 SCREWS.



H200_0016AAA

2-5-2. Connecting to External AC Power



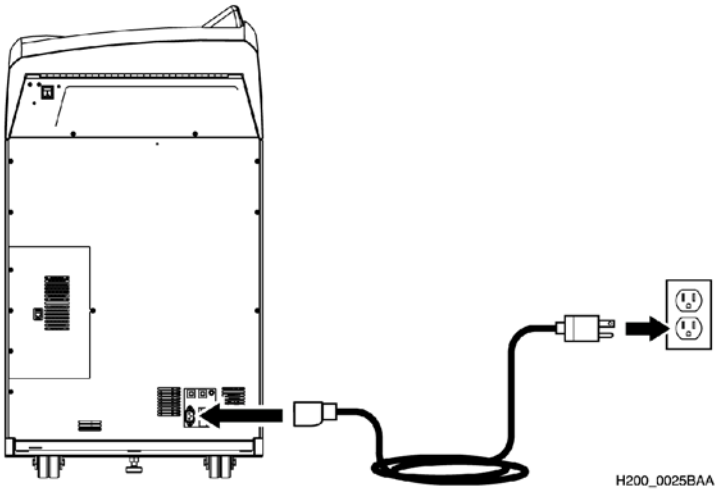
1. Remove and discard the CAUTION LABEL from the REAR PANEL.
2. Select a POWER CORD appropriate to this site from the 3 CORDS supplied in the ACCESSORIES PACKAGE

Note

If neither ”whole” CORD can be used, you will have to obtain and attach a suitable PLUG to the “universal” POWER CORD.

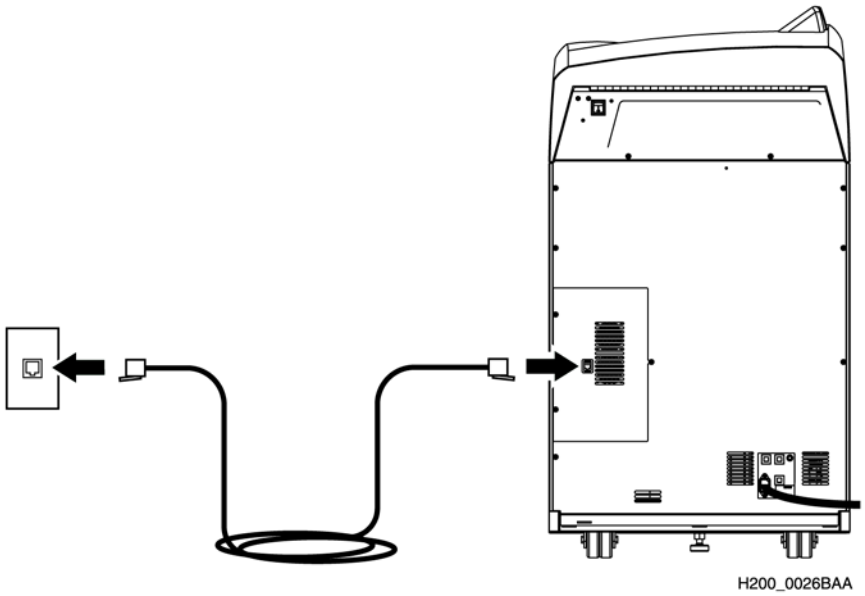
Warning

Dangerous Voltage!



3. Connect the selected POWER CORD, first to the IMAGER, then to the wall outlet.

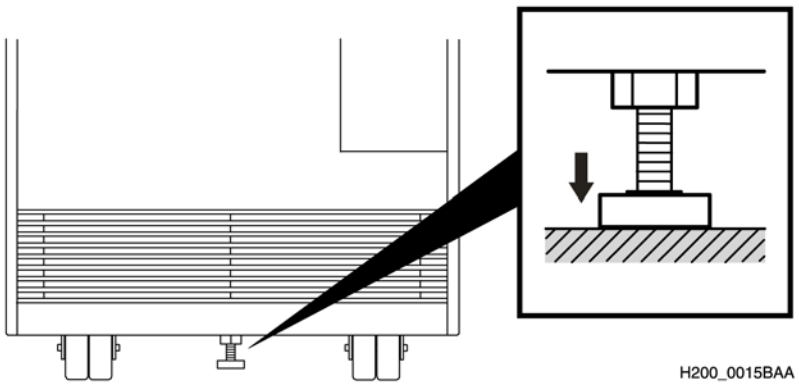
2-5-3. Connecting the IMAGER to the Network



Use the INTERNET DROP CABLE supplied in the ACCESSORIES PACKAGE to connect the IMAGER to the customer network.

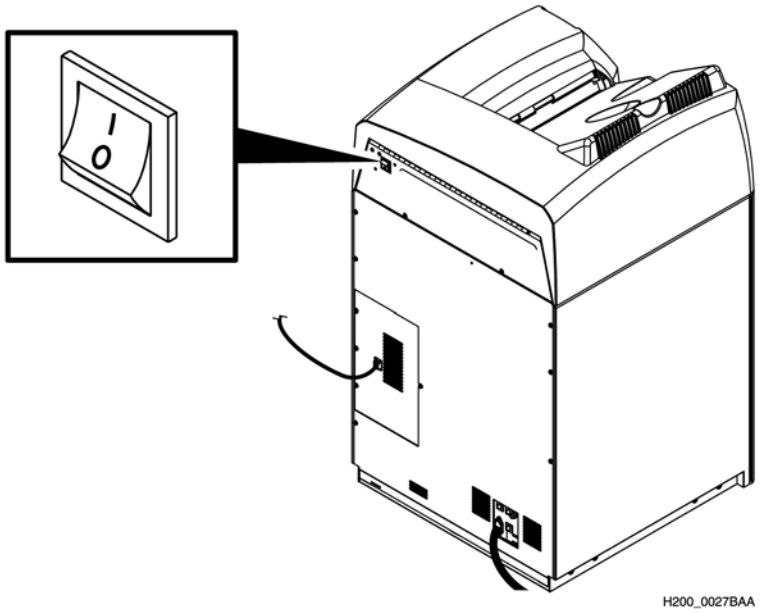
2-5-4. Securing the IMAGER in its Operating Position

1. Review the Location Requirements for the IMAGER. Refer to the Site Readiness Checklist for the *Kodak DryView* 8150 Laser Imager, document 7F3336.
2. Position the IMAGER precisely where it normally will be used.



3. Secure the IMAGER in position.
   a. Rotate the STOP clockwise by hand until it touches the floor.
   b. Tighten the LOCK NUT finger–tight against the BASE of the LASER IMAGER.

2-5-5. Applying Power



1. Check that the HOOD and FRONT DOOR are closed, and the REAR PANEL is installed.
2. Remove the protective plastic COVER from the LOCAL PANEL.
3. Press the POWER SWITCH to the ON (**|**) position.

2-6. Configuring the IMAGER

1. Use a straight–through INTERNET PATCH CABLE to connect your LAPTOP COMPUTER to the Service Port under the TOP HOOD.
2. Set the IP Address of your LAPTOP COMPUTER to 192.168.0.2 – (the IP address of the IMAGER service port is 192.168.0.1).

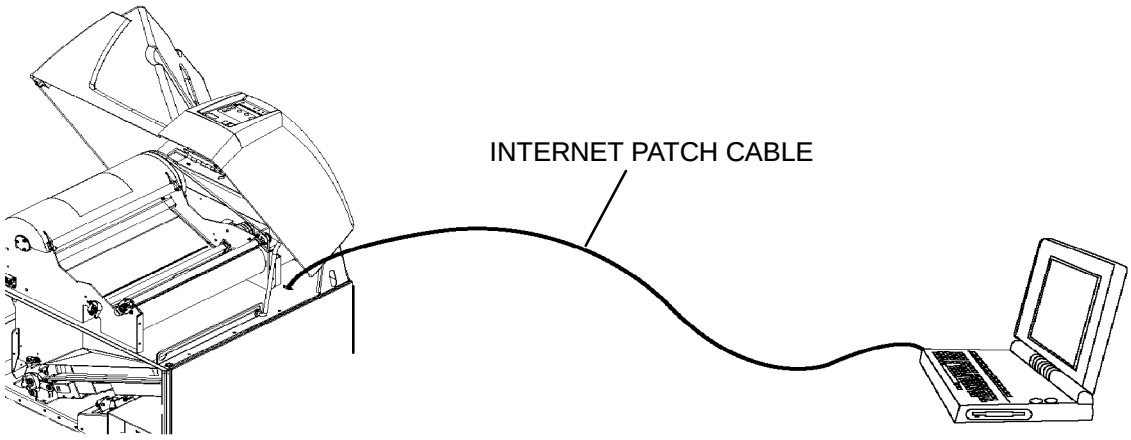


Figure 2-1. Connecting the LAPTOP COMPUTER to the IMAGER

3. Energize the LAPTOP COMPUTER.
4. Use “SecureLink” to connect to the IMAGER.

5. Launch “Service WebLink” to display the main menu of the SERVICE TOOL.
6. Expand the “Configuration” menu items.

2-6-1. Setting the “Host Name” and the “IP Address”

1. Obtain from the customer the “Host Name”, “IP Address”, “Subnet Mask”, and “Gateway” that will identify this IMAGER on the network.
2. From the main menu, select **Configuration>System>Network**.
3. Click [Modify].

Note

The Host Name is the network name for this IMAGER. It can be a maximum of 14 characters and a minimum of one. The first character must be a letter. Other characters can be a letter, number or a –.

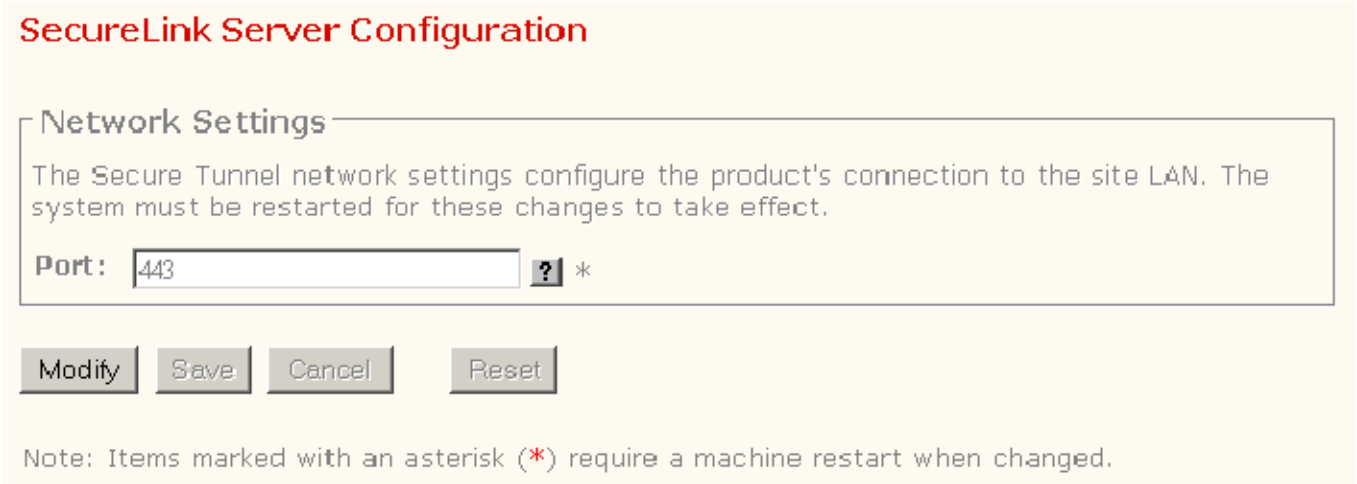
4. Enter:
   - “Host Name”
   - “IP Address”
   - “subnet Mask”
   - “Default Gateway”
5. Click [Save].
6. Restart the IMAGER from the LOCAL PANEL to enter the network data into the system.

Note

The Host Name and IP Address data can also be entered from the LOCAL PANEL: **Main Menu>Setup Imager>Network Setup**. (IMAGER must be restarted.)

2-6-2. Checking the Port Number of the “Secure Tunnel”

1. From the main menu of the SERVICE TOOL, select **Configuration>System>SecureLink**.


SecureLink Server Configuration
Network Settings
The Secure Tunnel network settings configure the product's connection to the site LAN. The system must be restarted for these changes to take effect.
Port:
443
?
*
Modify
Save
Cancel
Reset
Note: Items marked with an asterisk (*) require a machine restart when changed.

2. Check that the “Port” setting is 443.

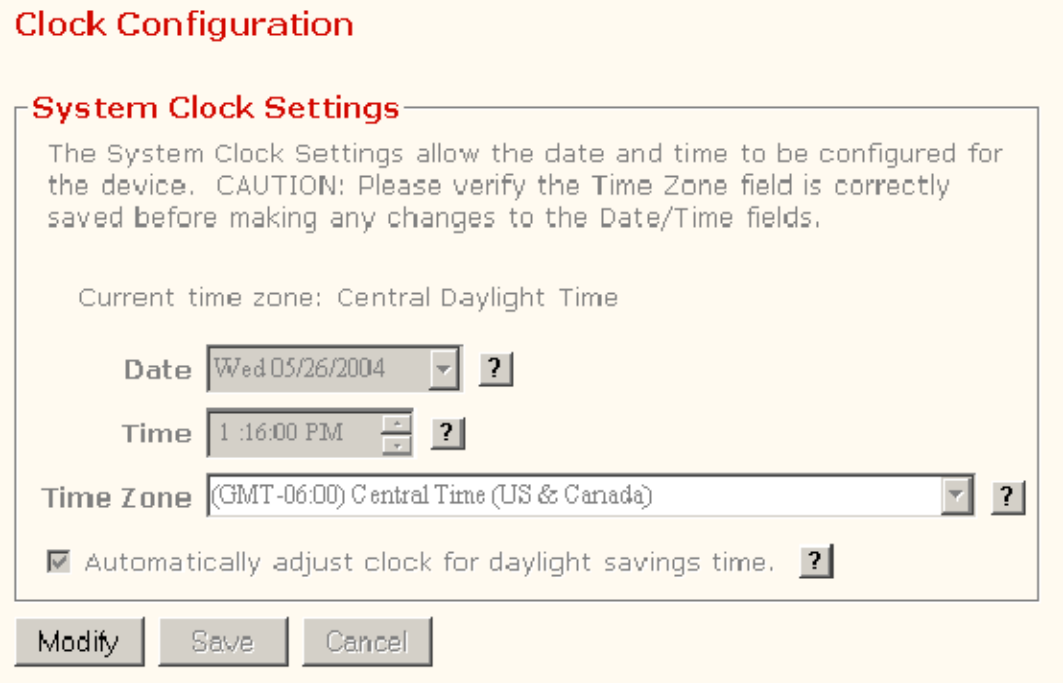
Note

If the Port setting is not 443, you will not be able to back up the configuration.

3. If the Port setting is not 443:
   a. Click [Modify].
   b. Type : **443**
   c. Click [Save].
   d. Restart the IMAGER from the LOCAL PANEL.

2-6-3. Setting the System Clock

1. From the main menu of the SERVICE TOOL, select **Configuration >System>Clock**.


Clock Configuration
System Clock Settings
The System Clock Settings allow the date and time to be configured for the device. CAUTION: Please verify the Time Zone field is correctly saved before making any changes to the Date/Time fields.
Current time zone: Central Daylight Time
Date
Wed 05/26/2004
Time
1 :16:00 PM
Time Zone
(GMT-06:00) Central Time (US & Canada)
Automatically adjust clock for daylight savings time.
Modify
Save
Cancel

Note

The system clock is set in manufacturing. At installation, the “Time Zone” setting has to be changed if the IMAGER is installed in a different time zone. When the “Time Zone” setting is changed, the “Time” and “Date” should display correctly.

2. To correct the “Time Zone” setting:
   a. Click [Modify].
   b. Select the correct Time Zone from the “Time Zone” dropdown menu.
   c. Click [Save].
3. If the “Time” value is incorrect:
   a. Click [Modify].
   b. Select a field in the “Time” window and use the Arrows to increase or decrease the time.
   c. Click [Save].
   d. Notify Service Engineering that the time was incorrect and had to be changed.

Note

The “Date” can be changed only by Level 5 personnel. If necessary, you can obtain 24 hours Level 5 access to the IMAGER from TSC.

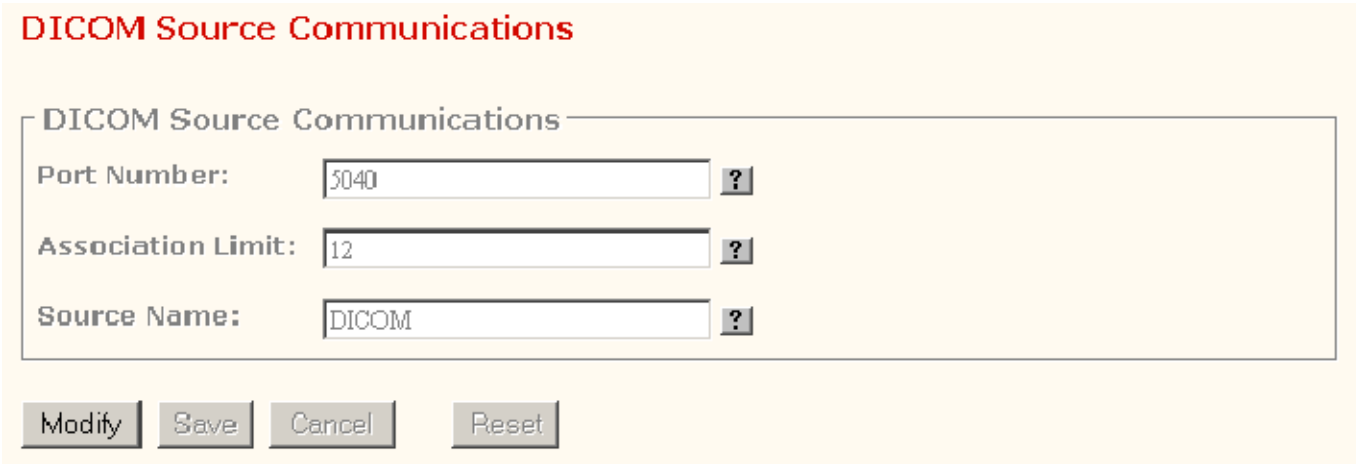
4. If the “Date” display is not correct:
   a. Obtain Level 5 access to the the IMAGER from the TSC.
   b. Click]Modify].

c. Use the “Date” dropdown calendar, or select fields in the “Date” window to change the date.
d. Click [Save].

5. If daylight saving time applies in the area of the installation:
   a. Click [Modify].
   b. Place a check in the “Automatically adjust clock for daylight savings time” check box.
   c. Click [Save].

2-6-4. Checking the Values for “DICOM Source Communications”

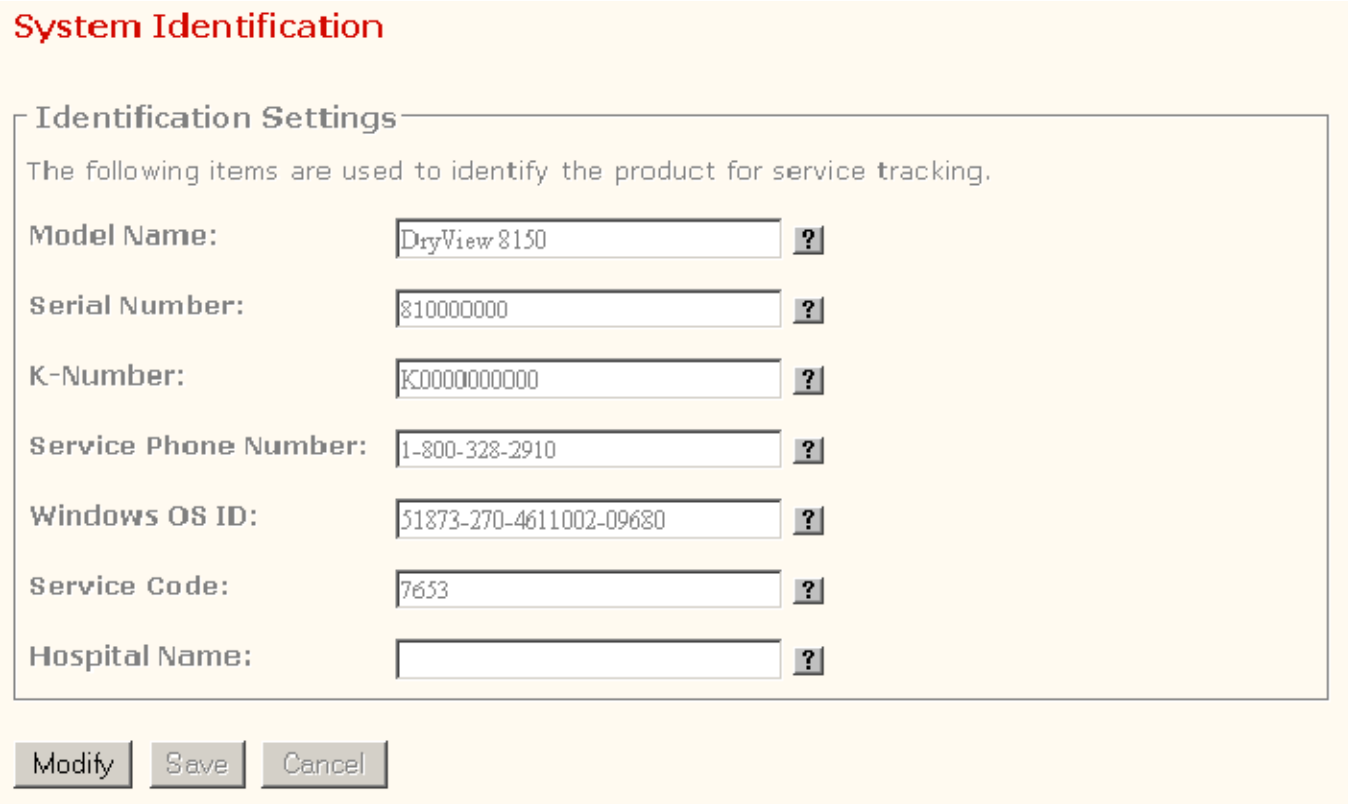
1. From the main menu of the SERVICE TOOL, select **Configuration>DICOM SCP>Communications**.



2. Check that:
   - “Port number is “5040”.
   - “Association Limit” is “12”.
   - “Source Name” is “DICOM”.
3. If the values are not correct:
   a. Click [Modify].
   b. Enter the correct values.
   c. Click [Save].

2-6-5. Setting up Service Tracking

1. From the main menu of the SERVICE TOOL, select **System Information>Identification**.



2. Click [Modify].
3. Enter the correct information in the following fields:
   - “Model Name”
   - “Service Phone Number”
   - “Phone Number”

Note

The K–Number should match the decal on the machine. Serial number changes require Level 5 certification.

4. Click [Save].

2-6-6. Configuring “SCP Services”

The *Kodak DryView* 8150 LASER IMAGER comes with a Modality Preferences Databse (MPDB). When a modality sends information to the 8150 the first time, the software will look at the DICOM unique ID and check for a match in the MPDB table. If it finds a match, it will send a TFT and contrast/density settings.

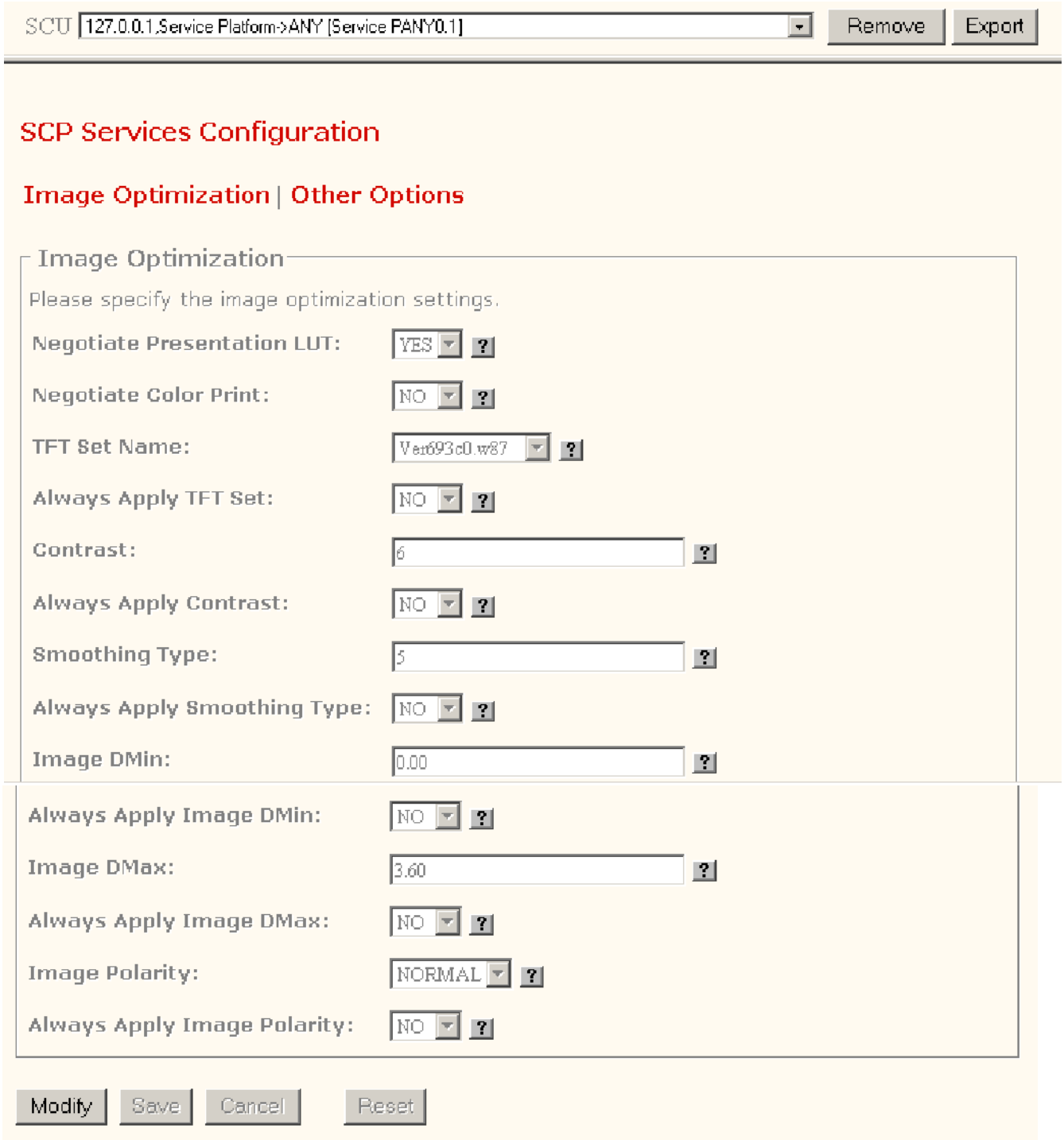
Note

Before this configuration procedure can occur, each MODALITY that will use this IMAGER must send an image to it.

1. From the main menu of the SERVICE TOOL, select **Configuration>DICOM SCP>SCP Services**.

Note

The SERVICE TOOL will display a screen of “Image Optimization” parameters with default parameter values selected from the Modality Preferences Database in the DRE.



Note

- The parameter default values on the screen apply to the MODALITY identified in the “SCU” window at the top of the screen.

- The information in the “SCU” window includes, in order: IP Address and AE Title of the SCU sender, and AE Title of the destination.
- You can open the “SCU” window to display a dropdown list of all SCUs connected to the IMAGER.
- You must do “Image Optimization” and “Other Options” for each SCU in the dropdown list.

2. Check each default parameter on the “Image Optimization” screen.
3. Do the following to determine whether a change to a default parameter is necessary:
   a. Check the DICOM log for details relating to the print job sent down from the MODALITY. The parameter values on the “Image Optimization” screen should match any values sent from the MODALITY.
   b. See Table 2-1 for descriptions of the parameters and recommended settings.
   c. Refer to paragraph 2-12 at the end of this section for recommended settings, by type of MODALITY, for the following parameters: TFT Set Name, Contrast, Smoothing Type, and Image Dmax.
   d. Check the quality of printed images sent from the MODALITY.

Table 2-1. Selecting the ’Image Optimization” Parameters

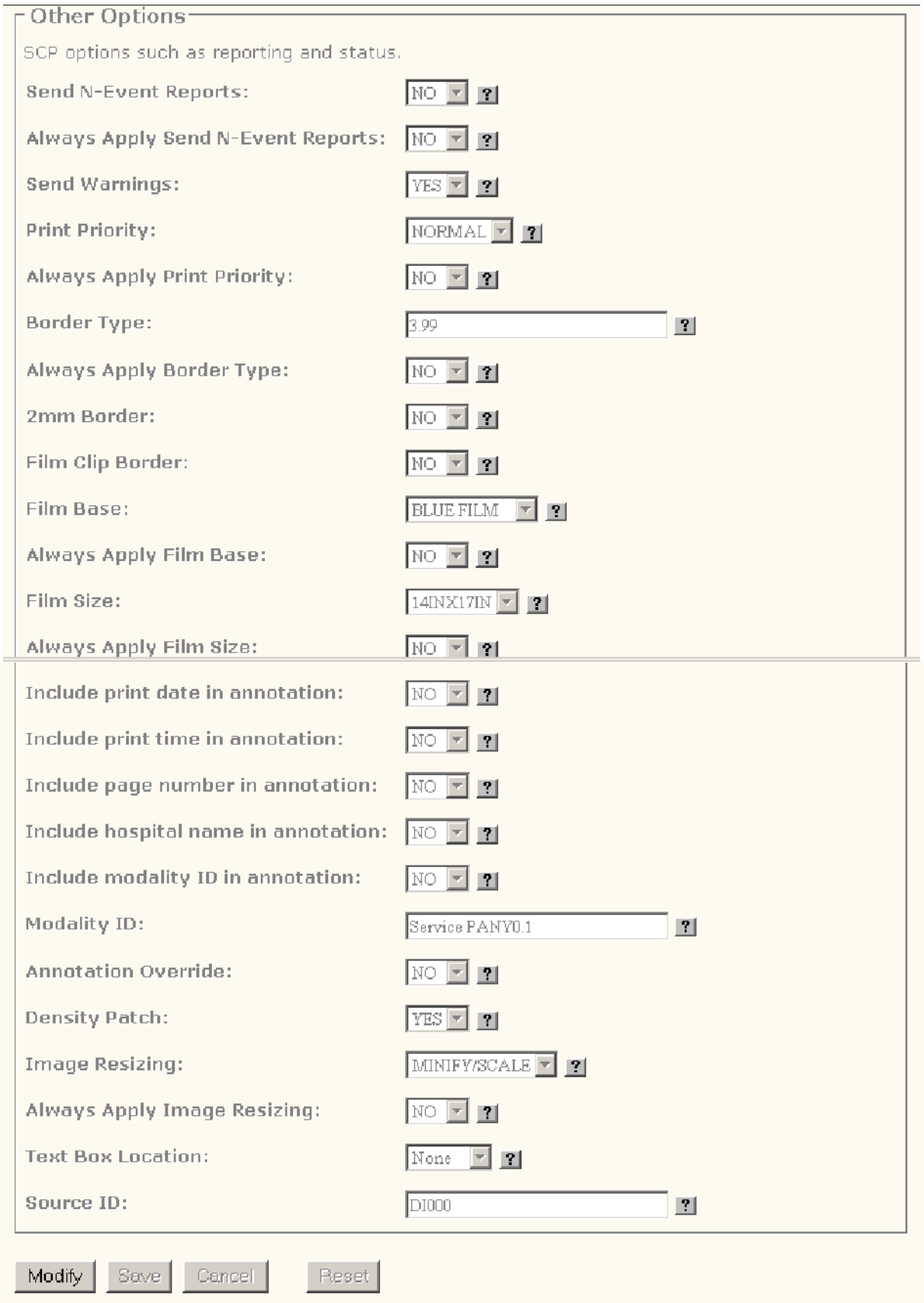
Parameter	Description	Recommended Setting
Negotiate Presentation PLUT	Some SCUs can apply standard PLUT parameters that provide improved tone scaling of images. The SCP must agree to negotiate this PLUT.	YES, for those SCUs with PLUT capability.
Negotiate Color Print	Determines if the SCP will negotiate the Color Print Service if requested by the SCU.	NO
TFT Set Name	Name of a particular set of 15 TFT curves. Each curve in the set is identified by a corresponding user–selectable contrast number, 1-15.	See paragraph 2-12. For Always Apply..., select NO.
Contrast	The number selected determines which table from the set of 15 will be used.	See paragraph 2-12. You may need to run contrast test prints at various settings to select the correct contrast value. For “Always Apply...”, select NO.
Smoothing Type	A smoothing value (0-15) specifies a level of smoothness/sharpness in transitions between density levels on the image.	See paragraph 2-12. For Always Apply...”, select NO.
Image Dmin	Minimum density of the image.	0.0 For “Always Apply..., select NO.
Image Dmax	Maximum density of the image. Cannot be higher than border density.	See paragraph 2-12. For “Always Apply...,” select NO.
Image Polarity	The polarity of the printed image with respect to the image from the SCU. NORMAL (default) specifies same polarity, REVERSE the opposite.	POSITIVE for most SCUs. NEGATIVE for Nuclear Medicine. For “Always Apply..., select NO.

4. To change a parameter value, if necessary:
   - Click [Modify].
   - Select the desired parameter from the dropdown menu for the parameter.
   - Click [Save].

Note

For some parameters you have the option to “Always Apply...”. If you select YES, the parameter on the screen will override the parameter that the SCU sends. If you select NO, the SCU parameter will apply. Normally you should allow the SCU to override.

5. After checking, and modifying, if necessary, the “Image Optimization” parameters, select “Other Options” from the top of the screen.



6. Check each parameter.

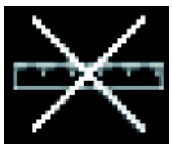
7. See Table 2–2 for descriptions of the “Other Options”. The default values shown on the screen have been selected from the Modality Preferences Database in the DRE.
8. Change parameters only if necessary.
9. To change a parameter:
   a. Select [Modify].
   b. Select the new parameter value from the dropdown menu for that parameter.
   c. Click [Save].

Table 2-2. Selecting “Other Options” Parameters

Parameter	Description	Recommended Setting
Send N_Event Reports	The IMAGER can automatically send changes in its status to the SCU when the changes occur.	YES, unless the user does not want the reports sent. (Such reports can cause problems in some SCUs.) For “Always Apply...”, select NO.
Send Warnings	The IMAGER can also send non–fatal warning messages to the SCU when problems occur (film jams, etc.)	YES, unless the user does not want the messages sent.
Print Priority	The order of printing from the SCUs can be prioritized by selecting LOW, NORMAL, or STAT (High) priority for particular SCUs,	Check with the user for the print priority for this SCU. For “Always Apply...”, select NO.
2mm Border	Selects 2mm border for non–requested image size jobs.	The default is NO.
Film Clip Border	Enbles use of clipping border of 22.1 mm for jobs that have more than one image with a requested image size that does not resize images.	The default is NO.
Film Base	BLUE FILM or CLEAR FILM	If the SCU does not send film base type: • Select the correct type. • For “Always Apply...”, select YES.
Film Size	3 sizes are available: 14 x 17 in., 11 x 14 in., and 14 x 14 in.	Select the correct size. For “Always Apply...”, select NO.
Include print date in annotation	If the user wants the date of “image acquisition” to be annotated on the print, select YES.	Check with user.
Include print time in annotation	If the user wants the time of printing to be annotated on the print, select YES.	Check with user.
Include page number in annotation	If the user wants the page number sequence in a multi–page study to be annotated on the prints, select YES.	Check with user.
Include hospital name in annotation	If the user wants the hospital name to be annotated on the print, select YES. This name will be the same as that entered on the Service Tracking screen.	Check with user.

Include modality ID in annotation	If the user wants the modality ID to be annotated on the print, select YES. See the item below.	Check with user.
Modality ID	The Modality ID indicated will be printed in the Annotation Text Box on the print. The ID includes the first 8 characters of the SCP node Name plus the 2 last octets of the SCU IP Address.	Check with user.
Annotation Override	If you select YES, the values entered for all the annotation parameters will override any values sent down from the SCU.	Select NO.
Density Patch	Use of the Density Patch is selectable only for 14 x 17 in. film.	Default is YES, but check with the user.
Image Resizing	The 2 options are MINIFY/SCALE or CROP. • To “minify” is to decrease the image by removing pixel data via a software algorithm if the raw image is too large for the film. When this occurs, the “minify” icon is printed on the film. See Figure 2-2. • To “scale” is to de–magnify, or scale down, the image if the requested image size is too large for the film. When this occurs,the “scale” icon is printed on the film. See Figure 2-2. • To “crop” is to remove the edges of the image so it fits on the film. The uncropped part of the image will remain true size. When this occurs, the “crop” icon is printed on the film. See Figure 2–2.	Check with the user. If MINIFY/SCALE is selected, the IMAGER will determine which type of demagnification is to be used, either MINIFY or SCALE. For Always Apply...”, select NO. Some SCUs have the ability to indicate type of resizing and should be allowed to override the default value set in the IMAGER.
Text Box Location	This parameter applies only to “1-up” images on 14 x 17 in. film, when crop has been selected for image resizing. Text Box Location indicates the location on the page for the annotation box. The box can be cut and pasted on the cropped image at the TOP or BOTTOM of the film.	Check with user for desired location. Select NONE if cropping is not used.
Source ID	This is the source name used for logging DICOM communications from this SCU. It also identifies the SCU in the SERVICE TOOL print statistics.	Select a short name for the SCU.

Minify Icon



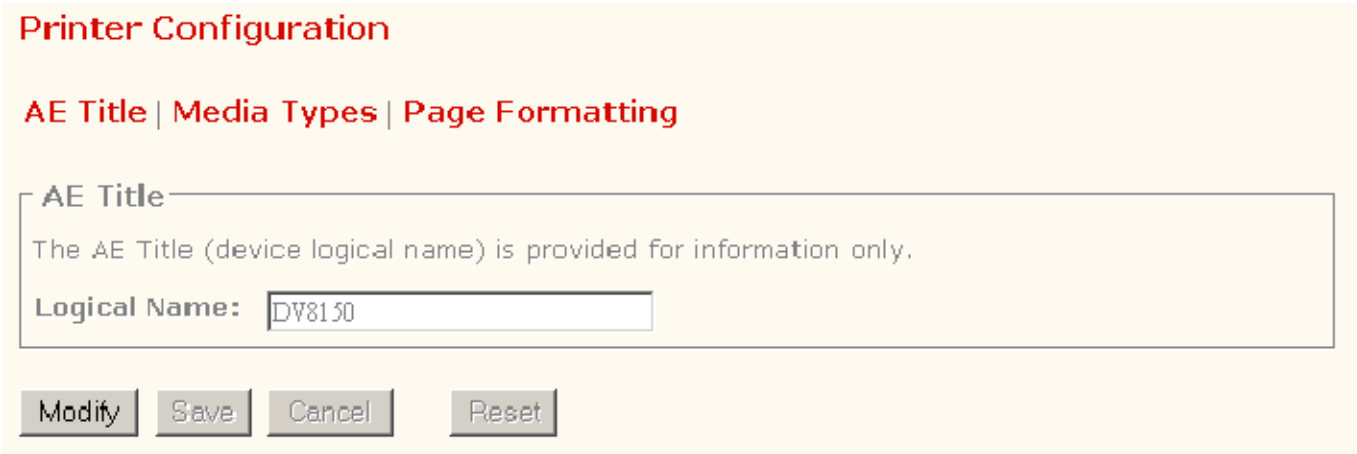
Scale Icon

Crop Icon

Figure 2-2. Cropping Icons

2-6-7. Configuring the IMAGER to be a Destination

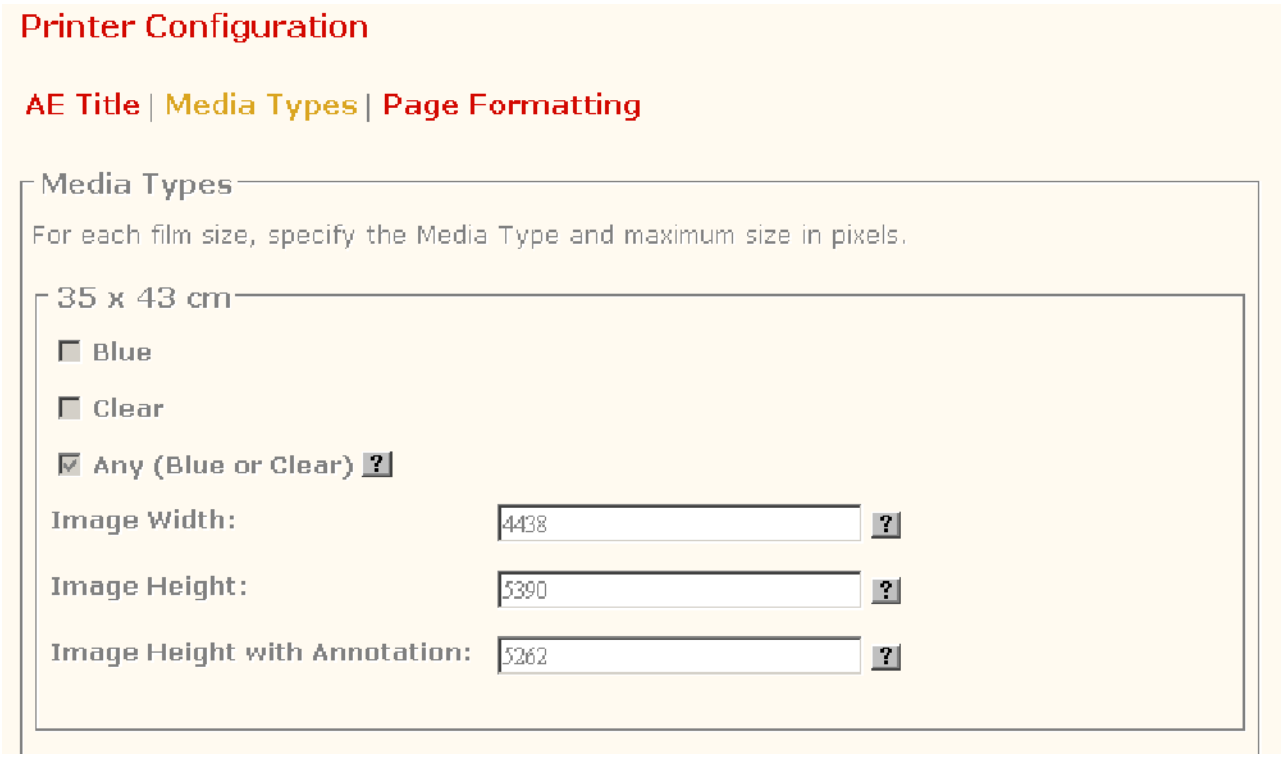
1. From the main menu of the SERVICE TOOL, select **Configuration>Destination**.



Note

The “AE Title” on the 8150 cannot be changed. The 8150 does not care what the modality uses for an AE Title for the PMA destination.

2. To select the film types to be used in the IMAGER, select “Media Types”.



Note

A “Media Types” screen will display for each of the 3 film sizes. The example above is for 35 by 34 cm (14 by 17 in.) film.

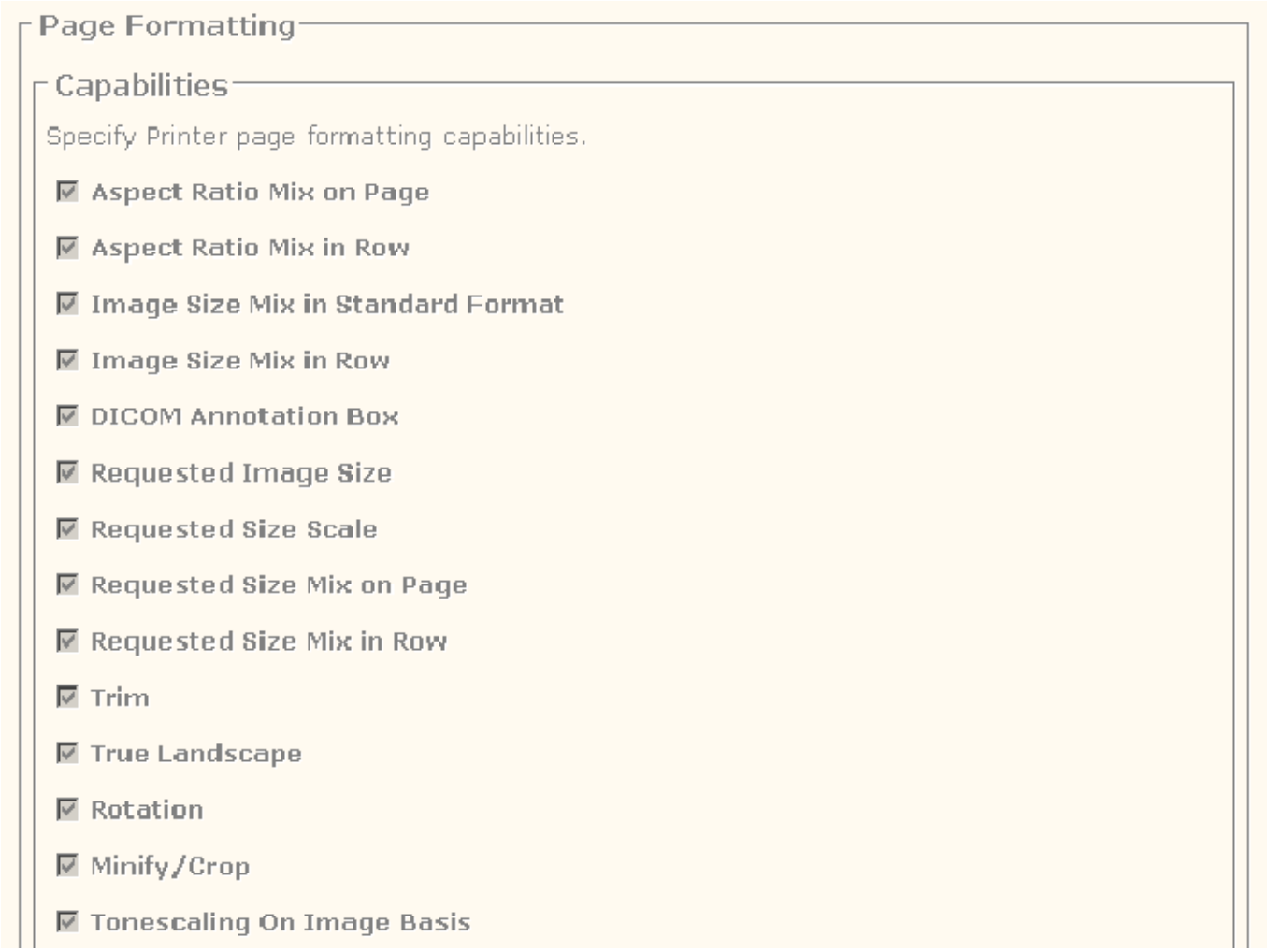
3. For all film sizes that will be used, select “Any (Blue or Clear)” for the “Media Type”.

Note

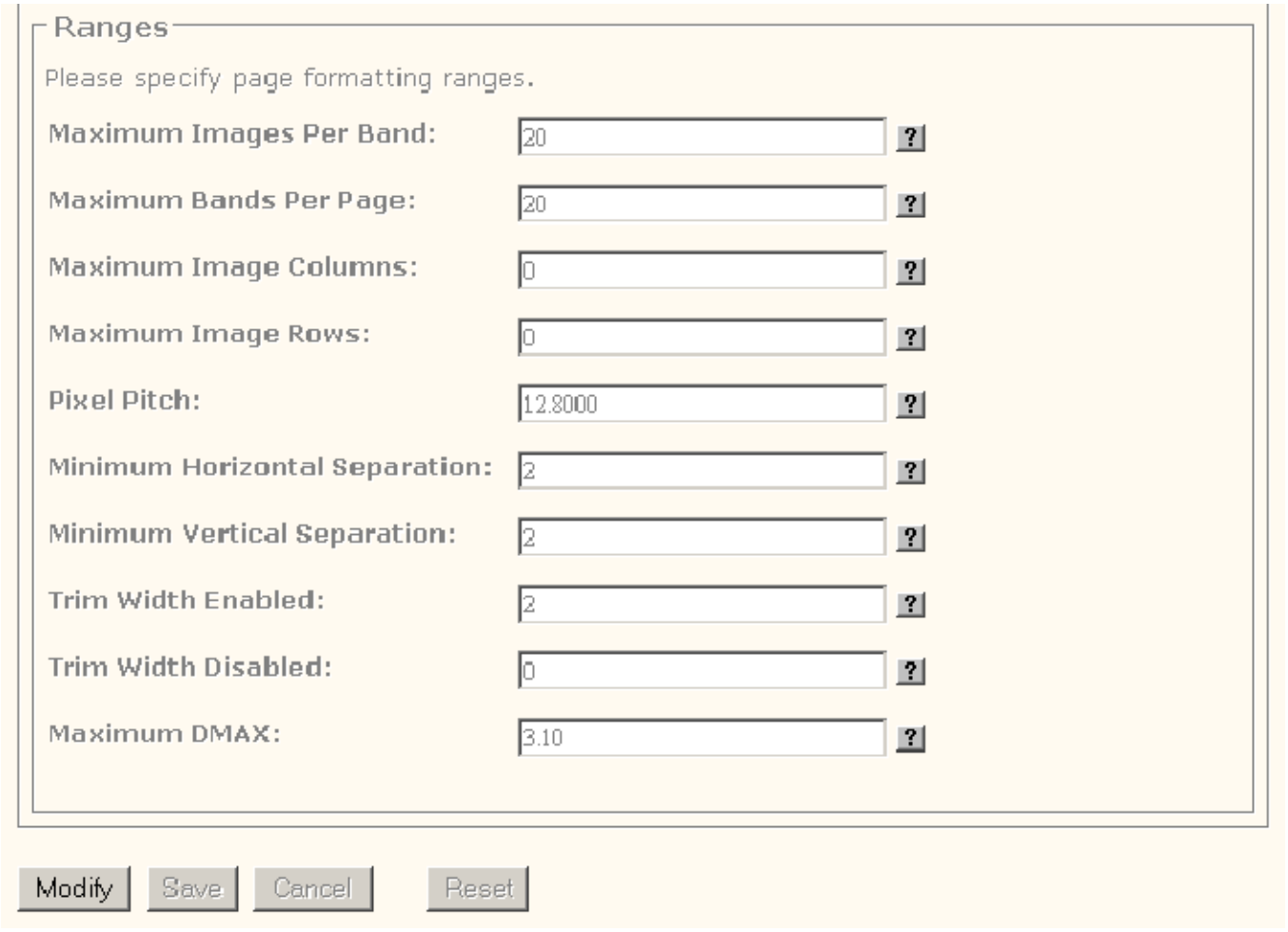
Do not change the default values shown for “Image Width” and “Image Height”. These values select the maximum number of pixel positions for a “1–up portrait image” on the page. The “Image Height” is reduced for pages with “annotation”. For page formats other than “1–up”, the following applies:

- In any column of images on the page, the sum of all “Image Heights” plus all separations between images cannot exceed the “Image Height” pixel value.
- In any row of images on the page, the sum of all “Image Widths” plus the separations between images cannot exceed the “Image Width” pixel value.

4. From the “Printer Configuration” screen, select “Page Formatting”.



5. Do not disable any of the Page Formatting Capabilities” of the IMAGER unless instructed to by the customer.
6. Check the “Ranges” on the lower part of the screen.



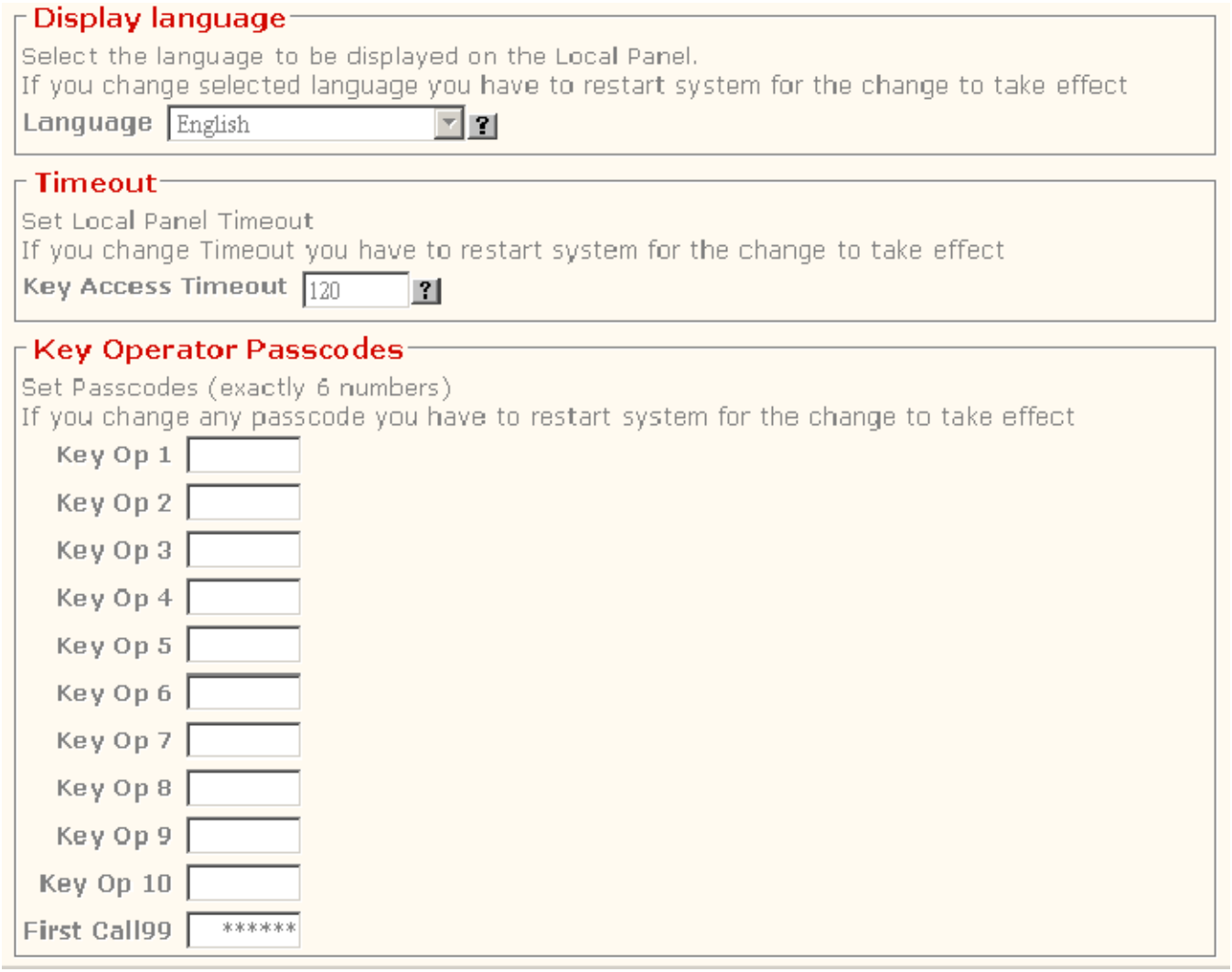
Note

You must check with the user before changing any of the “Ranges” values.

7. If it is necessary to change any value on the “Page Formatting” screen:
   a. Click {Modify].
   b. Enter the new value.
   c. Click [Save].

2-6-8. Configuring the LOCAL PANEL

1. From the main menu of the SERVICE TOOL, select **Configuration>MCS>LP**.


Display language
Select the language to be displayed on the Local Panel.
If you change selected language you have to restart system for the change to take effect
Language
English
Timeout
Set Local Panel Timeout
If you change Timeout you have to restart system for the change to take effect
Key Access Timeout
120
Key Operator Passcodes
Set Passcodes (exactly 6 numbers)
If you change any passcode you have to restart system for the change to take effect
Key Op 1
Key Op 2
Key Op 3
Key Op 4
Key Op 5
Key Op 6
Key Op 7
Key Op 8
Key Op 9
Key Op 10
First Call99
******

2. Check the “Display language” window.
3. If you need to change the language that will be used on the LOCAL PANEL:
   a. Click [Modify].
   b. Select the desired language from the “Language” dropdown menu.
   c. Click [Save].

Note

“Key Access Timeout“ is the number of seconds that passcode-protected screens on the LOCAL PANEL will remain on before automatically closing and returning to the “Status” screen. The timeout can be set from 30 to 300 seconds.

4. If you wish to change the default timeout value:
   a. Click [Modify].
   b. Select the desired timeout value.

c. Click [Save].

Note

The “Key Operator Passcodes” section of the screen allows you to set passcodes that allow operators to access the service functions of the LOCAL PANEL. You can also change the Service passcode, labeled **First Call 99** on this screen.

- These passcodes can also be set directly from the LOCAL PANEL. See the User Guide for instructions.
- You can set the passcodes either now or during Operator Training.

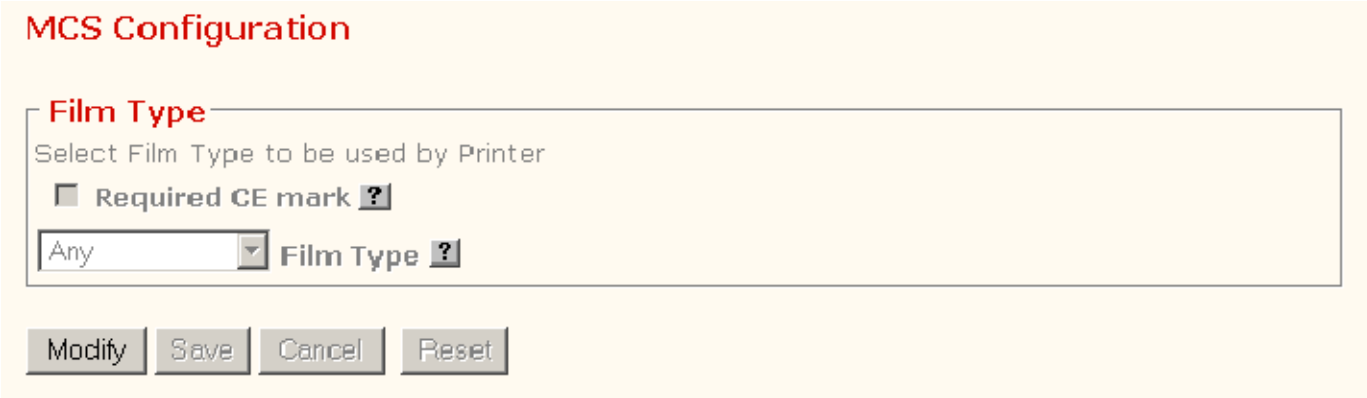
5. Ask the operators to create the passcodes they wish to use. (They must be 6–digits, numeric only.)
6. If you wish to enter the passcodes at this time:
   a. Click [Modify].
   b. Type each 6–digit passcode.
   c. Click [Save].
7. Change the Service Passcode.

   The Service passcode is **123456** when the IMAGER leaves the factory. At this time change this passcode to a new passcode that you choose. (The Service Passcode must be 6–digits, numeric only.)

   a. Click [Modify].
   b. Type the new Service Passcode opposite “First Call 99”.
   c. Click [Save].
8. If you modified any entry on the Local Panel Configuration screen, restart the system from the LOCAL PANEL for the new value to take effect.

2-6-9. Selecting the Type of Film

1. From the main menu of the SERVICE TOOL, select **Configuration>MCS>Film Type**.



2. If only CE marked film is to be used by the IMAGER:
   a. Click [Modify].
   b. Place a check in the “Required CE mark” check box.
   c. Click [Save].
3. Select “Any” from the “Film Type” dropdown menu.
4. Click [Save].

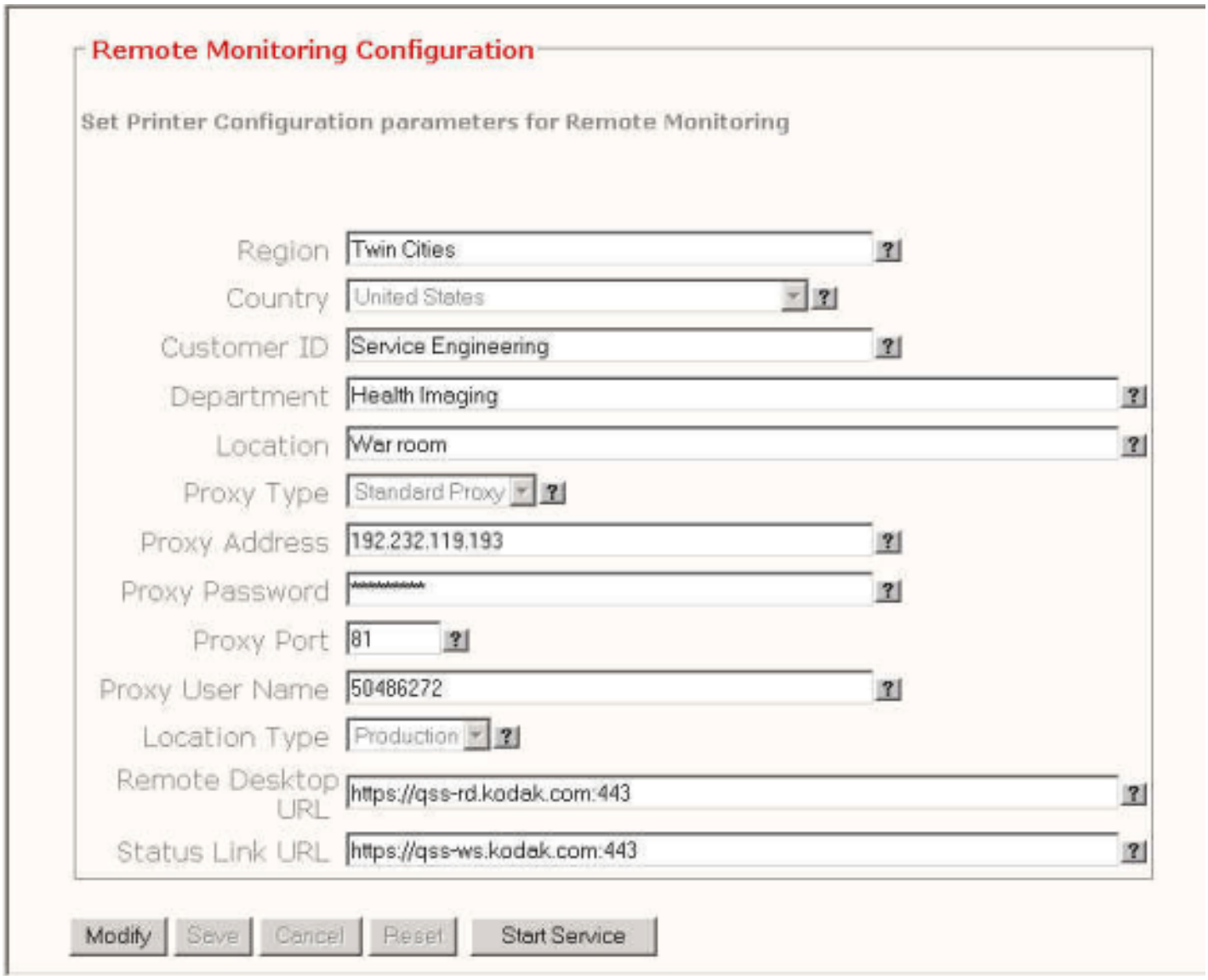
2-6-10. Setting up Remote Monitoring (RMS)

RMS uses the K–Number, Serial Number, Service Code, and Country to create the appropriate file names. Accuracy in this area is important. The other data entered helps to create a profile on the Enterprise server.

Before setting up RMS, contact TSC or xxxx to set up a group name under the appropriate region.

If this IMAGER is to be monitored remotely, configure it for remote servicing as follows.

1. From the main menu of the SERVICE TOOL, select **Configuration>System>Remote Monitoring**.



2. Click [Modify].
3. Enter into the appropriate windows the geographical and descriptive information that identifies this IMAGER.
4. From the “Proxy Type” dropdown menu, select the type of proxy server at this location:
   - No Proxy (the default)
   - Standard Proxy

- NTLM Proxy

Note

A “Proxy” is a server that stands between a machine (e.g., the IMAGER) and the Internet to ensure security and provide administrative control. It is associated with the gateway server that separates the customer network from outside networks and the firewall server that secures the customer network from intrusion.

5. Click [Save].
6. Click [Start Service].
7. Set up Remote Monitoring Grouping. Go on to procedure 2-6-11.

2-6-11. RMS Grouping

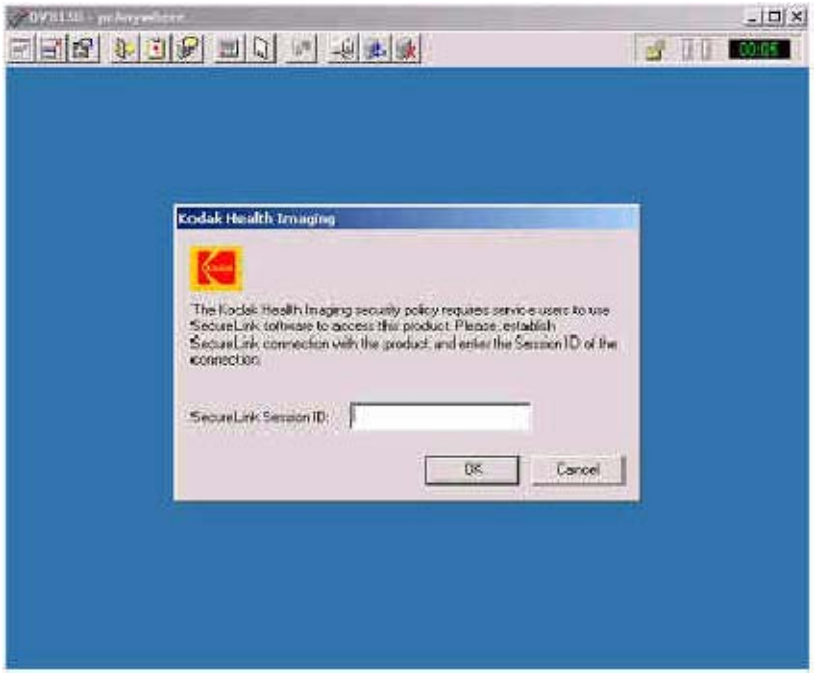
Perform this procedure after you have set up Remote Monitoring in procedure 2-6-10).

1. Using Symantec pcAnywhere™ remote access software, access the Imager:
   At the Logon screen:
   a. In the User Name Field, enter **pcanywhere**.
   b. In the Password field, enter **Netware28900**.
      Note: passwords are case sensitive.
   c. Click **OK**.
2. Click the **SEND Ctrl-Alt-Del to Host** button.

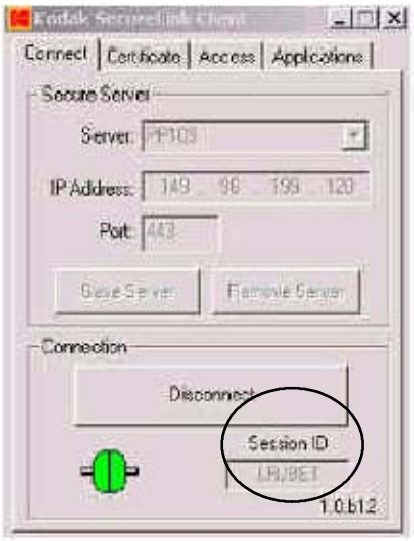
3. Log off the system.
   a. Click **Log Off**.
   b. Click **Yes**.

4. At the Microsoft Windows Logon screen:
   a. In User Name field, enter **pcanywhere**.
   b. In the Password field, enter **Netware28900**.
      Note: passwords are case sensitive.
   c. Click **OK**.

      You will be prompted for a Secure Link Session ID.


Kodak Health Imaging
The Kodak Health Imaging security policy requires service users to use SecureLink software to access this product. Please establish SecureLink connection with the product and enter the Session ID of the connection.
SecureLink Session ID:
OK
Cancel

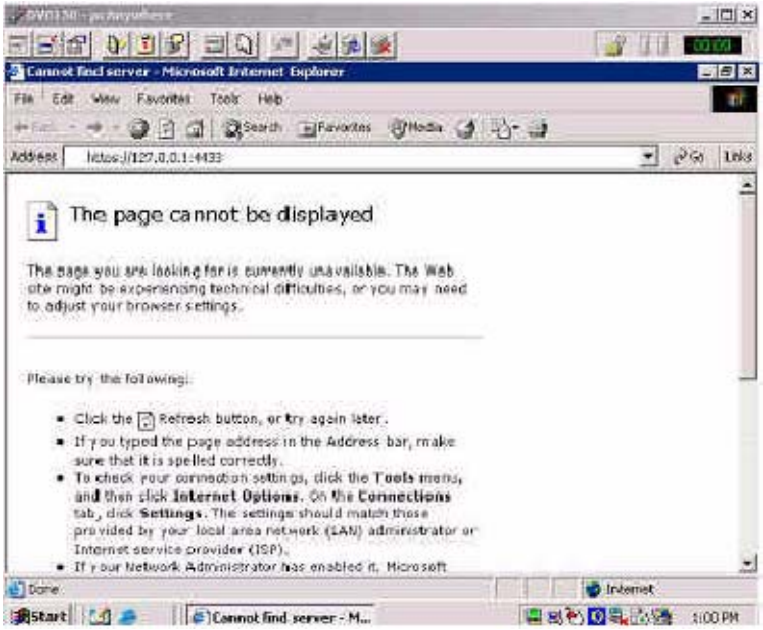
5. Start a Secure Link Session to obtain an ID.



6. In the pcAnywhere screen, type in the Session ID.
7. Click **OK**.

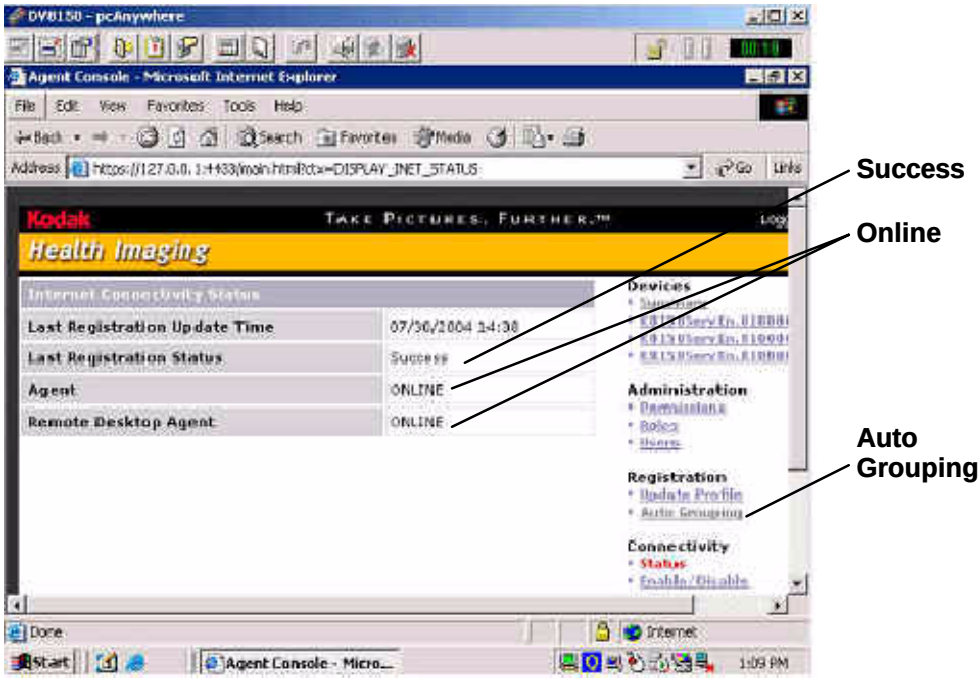
   The desktop of the IMAGER will appear.

8. Click on the Microsoft Internet Explorer icon.


Cannot find server - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://127.0.0.1:4433
Links
The page cannot be displayed
The page you are looking for is currently unavailable. The Web site might be experiencing technical difficulties, or you may need to adjust your browser settings.
Please try the following:
Click the Refresh button, or try again later.
If you typed the page address in the Address bar, make sure that it is spelled correctly.
To check your connection settings, click the Tools menu, and then click Internet Options. On the Connections tab, click Settings. The settings should match those provided by your local area network (LAN) administrator or Internet service provider (ISP).
If your Network Administrator has enabled it, Microsoft
Done
Internet
Start
Cannot find server - M...
1:00 PM

9. In the address field, type **https://127.0.0.1:4433**
10. Click **Go**.
11. Click **OK**.
12. At the Security Alert screen, click **Yes**.
13. At the Agent Console screen:
    a. In User Name field, enter **fe**
    b. In the Password field, enter **FE123**
       Note: Passwords are case-sensitive.
14. Click **Log In**.
15. Click **Status**.

    The following screen appears.



16. Verify that the registration was successful and both Agents are online.
17. Click **Auto Grouping**.
18. Select the appropriate group.

Note

This is the group you set up earlier.

19. Click **submit**.
20. If successful, close Internet Explorer:
21. Click the S**END Ctrl-Alt-Del** to Host button.
22. Click **Log Off**.
23. Click **Shutdown**.
24. Choose Shutdown from the pull-down window.
25. Click **OK**. This will shut down the IMAGER.
26. Turn Off the POWER SWITCH on the back of the IMAGER.
27. Turn the POWER SWITCH On.

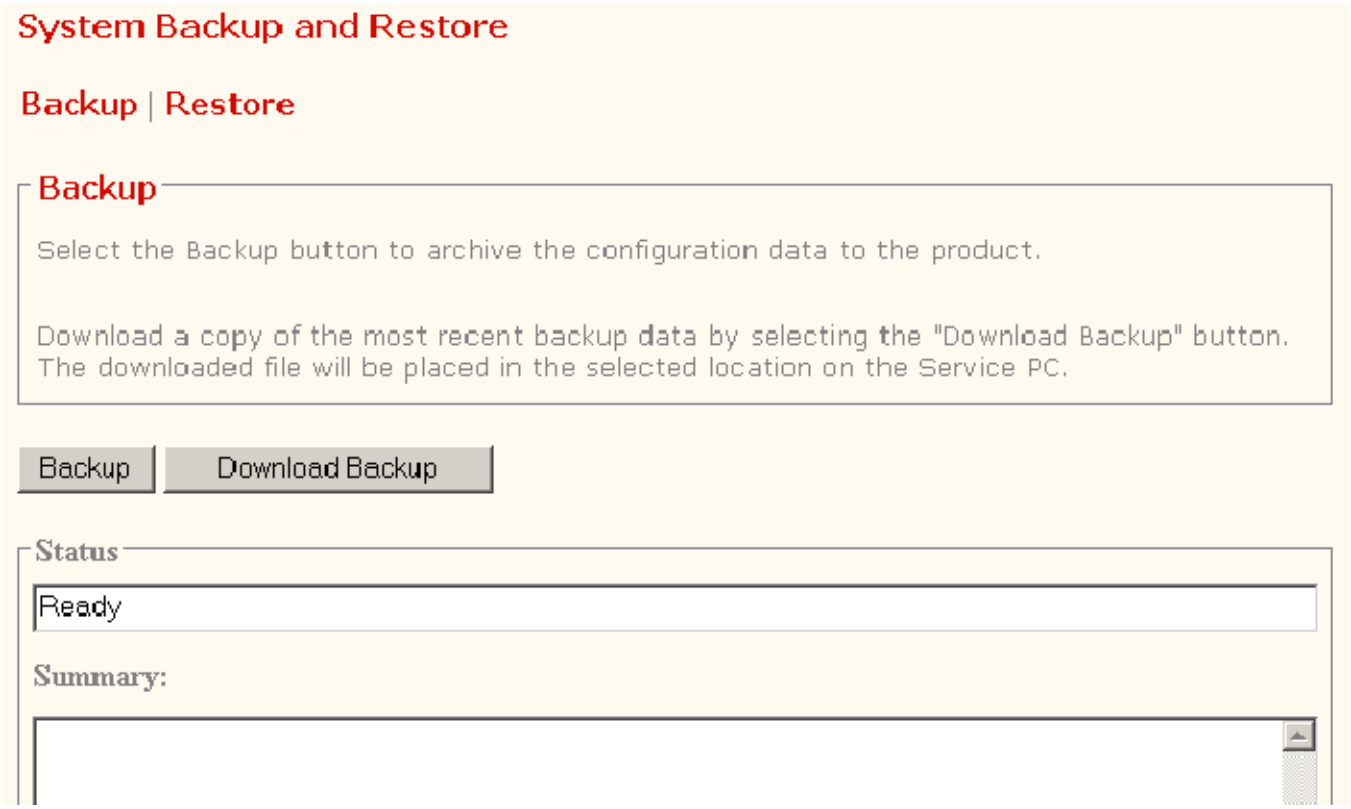
    The IMAGER will start up.
28. To verify that the grouping did occur, log on to the Enterprise Server and check for your Imager under the group that you selected.
29. Check off Mod 1 on the Field Change Record label and report M01.

2-7. Checking Image Quality

1. Ask the customer to send images from a MODALITY to the IMAGER.
2. Check the quality of the images.
3. If necessary, modify the configuration parameters.

2-8. Backing up the System Configuration

1. From the main menu of the SERVICE TOOL, select **Utilities>Backup / Restore**.


System Backup and Restore
Backup | Restore
Backup
Select the Backup button to archive the configuration data to the product.
Download a copy of the most recent backup data by selecting the "Download Backup" button.
The downloaded file will be placed in the selected location on the Service PC.
Backup
Download Backup
Status
Ready
Summary:

2. To store a backup of the configuration parameters on the DRE HARD DISK, click the [Backup] button.

Note

When the backup is completed, the “Summary” window will display results.

3. To download the configuration backup to a FLOPPY DISKETTE:
   a. Insert a FLOPPY DISKETTE in your LAPTOP COMPUTER.
   b. Click [Download Backup].
   c. When the “Save Copy As” screen appears, select the A drive and enter a file name for the backup file.
   d. Click [Save].
4. Store the FLOPPY DISKETTE in the IMAGER.

Note

Do not leave the backup DISKETTE in the IMAGER FLOPPY DRIVE.

2-9. Training Key Operators

Prepare key operators to use the IMAGER as follows:

1. Refer to the USER GUIDE for the *Kodak DryView* 8150 LASER IMAGER, and train the operators in the basic machine functions.
2. If you did not assign operator passcodes while configuring the LOCAL PANEL, do so now. See paragraph 2-6-8 .

There are 3 levels of operator access to the IMAGER (see Table 2-3).

- Ordinary operators – no passcode required
- Key operators (User ID 0–10) – Passcode required, assigned by FE or customer installer
- Customer Installer (User ID 99) – Passcode required, changed at installation

Note

If the customer has a Customer First technician, this person is assigned a special passcode required for resetting the PM count.

Table 2-3. Levels of Customer Access to IMAGER

Tasks	Ordinary Operators– No Passcode	Key Operators– ID 0-10 + Passcode	Customer Installer– ID 99 + Passcode
Shut down IMAGER	x	x	x
Open FRONT DOOR	x	x	x
Calibrate film	x	x	x
Run density test	x	x	x
IMAGER on line/off line	x	x	x
Printer enable/disable	x	x	x
Ping	x	x	x
Change FILTER	x	x	x
View system information	x	x	x
View versions	x	x	x
View print count	x	x	x
View jobs	x	x	x
View current errors	x	x	x
Change language of LOCAL PANEL	x	x	x
Log off		x	x
Delete queued print jobs		x	x
Delete “waiting for media” print jobs		x	x
Delete unprintable jobs		x	x
Adjust touch volume		x	x
Adjust backlighting of LOCAL PANEL		x	x
Adjust audible alarm		x	x
Edit service phone number		x	x

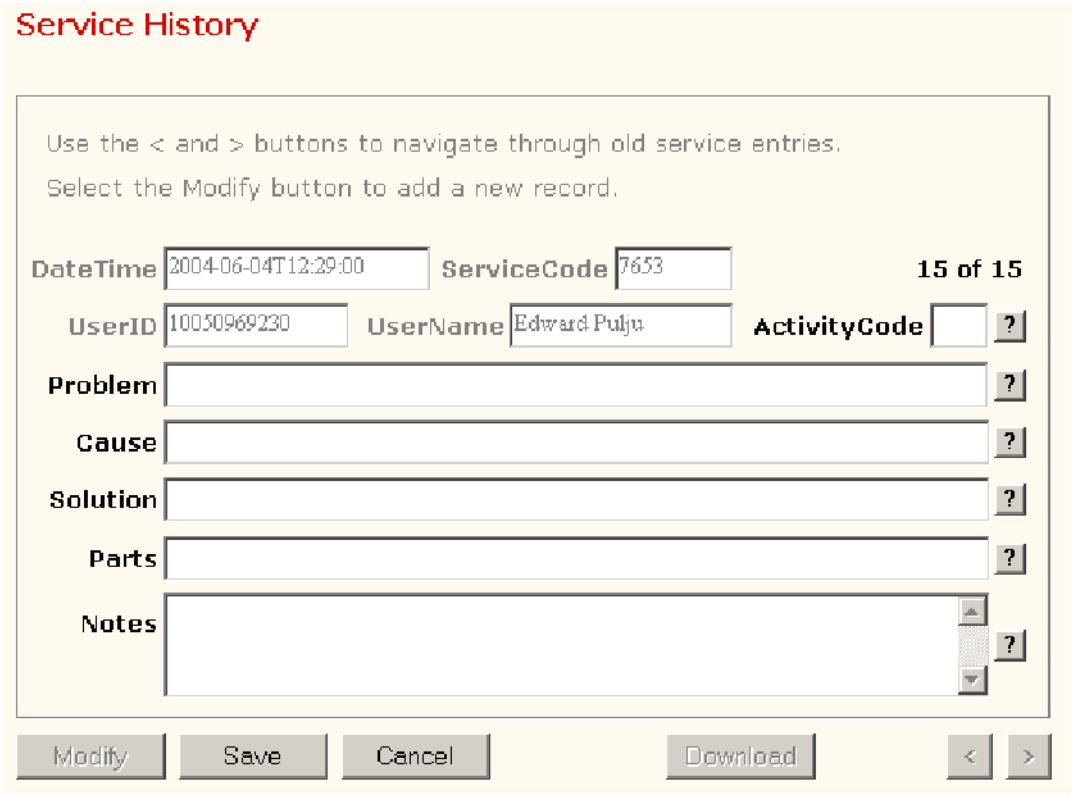
Date format			x
Date			x
Time format			x
Time			x
Network name			x
IP Address			x
Subnet mask			x
Gateway			x
Ping from network setup screen			x
DICOM port			x
Set up modality			x
Change/create passcodes			x
Calibrate touch screen			x
Back up configuration			x
Restore configuration			x
Install IMAGER			x
Add image sources			x

Note

- Kodak Level 4 (FEs) and Level 5 (SE and TSC) service personnel can access all machine functions shown in the table via SecureLink.
- Kodak Level 5 personnel can access IMAGER functions via Remote Management Services

2-10. Editing the Service History Log

1. From the main menu of the SERVICE TOOL, select **System Information>Service History**.



2. Click [Modify].

Note

The following fields on the screen are filled in automatically: “DateTime”, “Service Code”, and your Secure Tunnel “UserID” and “UserName”.

3. Enter data relating to the installation in the other fields on the screen.
4. Click [Save].

2-11. Guidelines for Selecting the Correct TFT Set and Related Parameters

This section provides basic information that will help you to select the proper values for the following 'Image Quality" parameters that must be input during configuration of SCP Services (see procedure 2-6-6).

- TFT Set Name
- Contrast
- Image Dmax
- Smoothing Type

2-11-1. Definitions

Item	Description
TFT	A table, or curve, used in closed loop *Kodak DryView* LASER IMAGERS that relates each digital input value to a corresponding target value of perceived brightness.
TFT Set	A set of 15 TFTs that represent 15 different curve shapes, each of which is associated with a corresponding user-selectable contrast selection, 1-15. See paragraph 2-12-3 for descriptions of individual TFT Sets.
Contrast	A user-selectable value from 1-15 that selects the correct TFT from the TFT Set for the current print.
Density	A user-selectable value that determines the maximum density (Dmax) used in printing.
Smoothing Type	A user-selectable value (1-15) that specifies a level of smoothness/sharpness in transition between density differences on film.
PLUT	Presentation LookUp Table
GSDF	Grayscale Standard Display Function

2-11-2. Selecting the Image Quality Parameters Appropriate to the MODALITY

Use Tables 2-4 and 2-5 to select the "Image Quality" parameters. The selections are based on MODALITY type. They also depend on whether the MODALITY is GSDF-compliant and whether it uses PLUTs.

- If the MODALITY **is not** DICOM GSDF-compliant, use the procedure in paragraph 2-12-3.
- If the MODALITY **is** DICOM GSDF-compliant and does not PLUTs or uses PLUTs for only some images, use the procedure in paragraph 2-12-4.
- If the MODALITY **is** DICOM-GSDF-compliant **and** uses PLUTs for all images, do not use either procedure. Leave the "Image Quality" parameters at the default values set by the Modality Preferences Database.

2-11-3. Selecting Parameters for MODALITIES that are not DICOM-GSDF-Compliant

1. Refer to Table 2-4 and find the type of MODALITY for which the IMAGER is being configured.
2. Select the TFT Set recommended in Table 2-4 for this type of MODALITY. If more than one set is listed, read the notes in the table for guidance in selecting the appropriate set.
3. Select the Table No. (contrast setting) recommended for the chosen TFT Set. If a number is in “bold,” select this number first (You may have to try more than one Table No, during the configuration process.)
4. Select the Image Density associated with the Table No. you chose. If there is a range of densities:
   - Select the density value indicated in bold, if there is one.
   - If there is no bold value, select the middle value. For example, if the range is 2.7 to 3.1, select 2.9.
   - If there are only 2 density values, select either one.
5. Select the Smoothing Type recommended in Table 2-4.
6. Enter the selected parameter values on the “Image Optimization” screen in the SERVICE TOOL.

2-11-4. Selecting Parameters for DICOM GSDF-Compliant MODALITIES

Note

This procedure does not apply to GSDF-Compliant MODALITIES that use PLUTs for **all** images.

1. Use TFT Set GSDF0.87.
2. Refer to Table 2-4 and find the type of MODALITY for which the IMAGER is being configured.
3. Select the Density (Dmax) recommended for this type of MODALITY. If there is a range of densities:
   - Select the density value indicated in bold, if there is one.
   - If there is no bold value, select the middle value. For example, if the range is 2.7 to 3.1, select 2.9.
   - If there are only 2 density values, select either one.
4. Refer to Table 2-5 and select the Table No. (contrast setting) that corresponds to the chosen Density (Dmax) value.
5. Refer to Table 2-4 and select the Smoothing Type for the selected type of MODALITY.
6. Enter the selected parameter values on the “Image Optimization” screen in the SERVICE TOOL.

Table 2-4. Recommended TFT Sets for MODALITIES

Type of MODALITY	TFT Set	Table No. (Contrast)*	Density (Dmax)*	Smoothing Type	Notes
Kodak and other **CR** (Computed Radiography) and **DR** (Digital Radiography) Systems. Also Workstations and imaging devices that output data to a linear–in–density contrast curve.	WRKSTN2A	1 **2** 3 4	3.1 **3.0** 2.9 2.8	5	Select Table number (contrast) and Dmax in the pairs shown. Do not use with *Fuji* CR.(See *Fuji* CR below.)
Fuji **CR**	FCR302C4	10 11 12 13 **14** 15	2.6 2.7 2.8 2.9 **3.0** 3.1	5	Table number (contrast) and Dmax must be chosen in the pairs shown. The contrast curves are approximately linear in density for most of the pixel value range, but become relatively flat at high (bright) pixel values. Designed for use with *Fuji* CR only.
CT (Computed Tomography) or **MRI** (Magnetic Resonance)	VER693C30	5, **7**, 8	3.0–**3.1**	15	Table 7 provides good grayscale range in all CT and MRI studies. Table 5 has less mid–tone contrast. Table 8 has more mid–tone contrast.
DSA (Digital Subtraction Angiography), including C–Arm and Digital Fluoro	VER713C0 Alternative 1	6, **7**, 9	**2.9**–3.1	15	VER713C0 provides brighter image background than VER693C0. Lower table numbers have less mid–tone contrast. Higher have more.
	VER693C0 Alternative 2	6, **7**, 9	**2.9**–3.1	15	VER693C0 provides darker image background than VER713C0. Lower Table numbers have less mid–tone contrast. Higher have more.
Note: * The number in bold should be the first choice when you are selecting parameter values.					

Phillips Medical Systems (PMS) – *EasyVision* and other **PMS** modalities.	PMSV3K	9	3.0, 3.1	15	Check with the PMS service engineer. On some PMS MODALITIES, image quality calibration must be run from the PMS control console.
Type of MODALITY	**TFT Set**	**Table No. (Contrast)***	**Density (Dmax)***	**Smoothing Type**	**Notes**
Nuclear Medicine	VER713C0 Alternative 1	5–**7**–10	2.2, 2.3	12	Table 7 is popular. Table 5 has less mid–tone contrast and shows more isotope takeup. Table 10 has more mid–tone contrast and reduces takeup visibility on film.
	PMSV3K Alternative 2	**10**–14	2.2, 2.3	12	Start with Table 10. Higher tables have increased brightness and reduce isotope takeup visibility on film. Lower tables show more takeup.
Siemens Host Control or WORKSTATION	WRKSTN2A	4	2.8	15	Typically the density is set to 2.8 by the Siemens host control software. Table 4 must be chosen for linear grayscale translation.
Ultrasound	VER693C0 Alternative 1	5–**8**–12	2.4–2.8	15	Table number choices vary with manufacturer and radiologist. Lower table numbers have less mid–tone contrast. Higher numbers have more.
	PMSV3K Alternative 2	7–**10**–13	2.4–2.8	15	Table number choices vary with manufacturer and radiologist. Higher table numbers have increased brightness.
Note: * The number in bold should be the first choice when you are selecting parameter values.					

Table 2-5. GSDF0 Dmax Setting vs. Table Number (Contrast) Setting

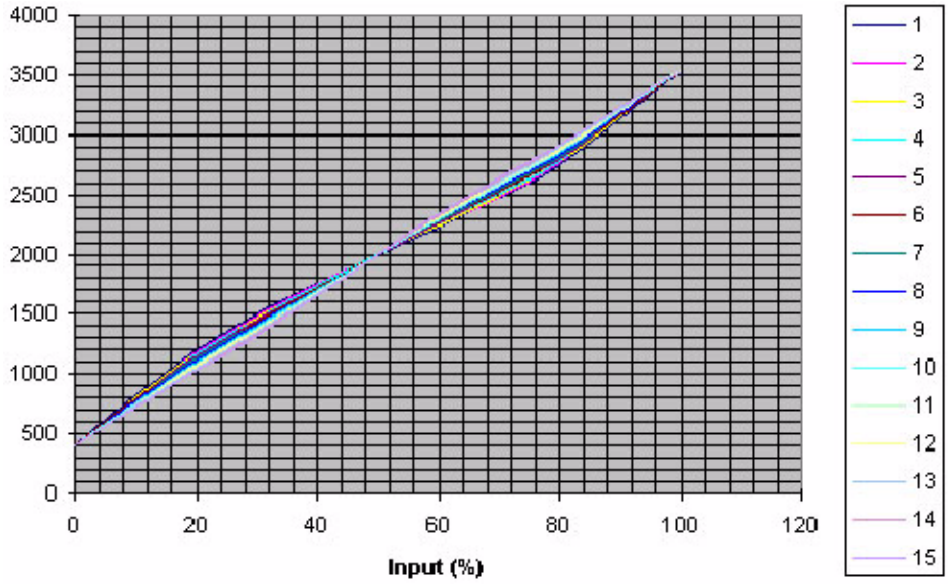
Density (Dmax)	Table No. (Contrast)
1.7	1
1.7	2
1.8	3
2.0	4
2.1	5
2.2	6
2.3	7
2.4	8
2.5	9
2.6	10
2.7	11
2.8	12
2.9	13
3.0	14
3.1	15
Density and Table No. must be chosen in the pairs shown.	

2-11-5. TFT Set Descriptions

AIRIS2A: Designed to meet Hitachi requirements for a TFT SET, that, when used for printing on *Kodak DryView* FILMS, can perceptually match films printed on a 969 HQ (wet) LASER IMAGER when TFT SET VER693C0, with Contrast = 6 and Dmax = 3.0, is used in the HQ.

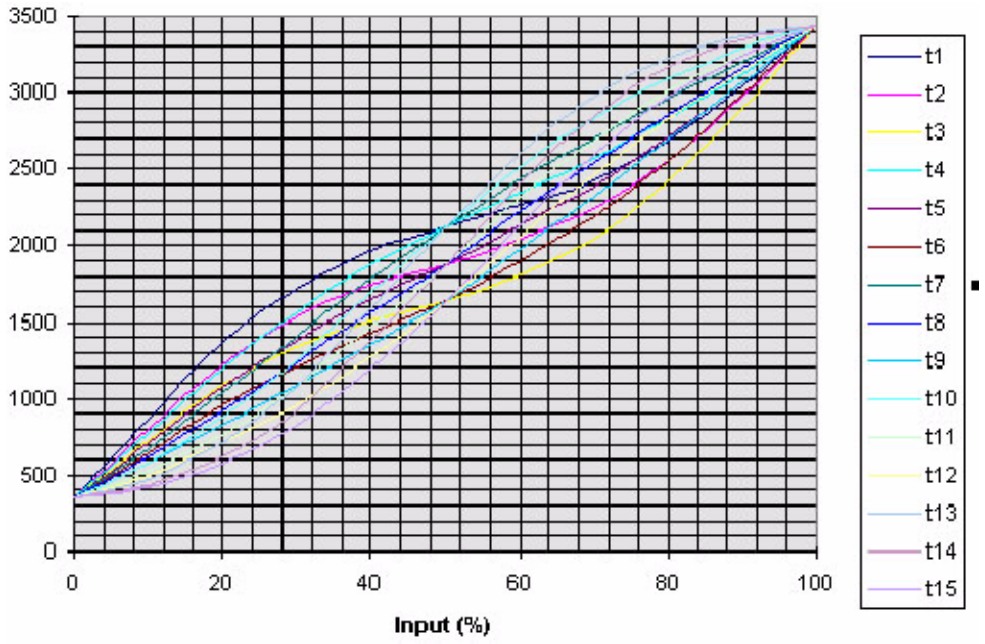
To do this, the AIRIS2A TFT SET is designed for overall similarity to the VER693C0 TFT SET, but provides lower measured densities in the darker part of the density range. In the AIRIS2A SET, Contrast = 8 TFT is designed to provide dry prints which match the Contrast = 6 wet prints made using VER693C0 on an HQ, with Dmax = 3.0 for both prints.

The plots of this TFT SET indicate that all 15 of the tables have the same mid-tone brightness, with varying degrees of an S-shape curve which gives the strongest end-point contrast, or slope, to Table 12 and the strongest mid-tone contrast to Table 15. Note that this TFT SET provides a narrower range of curves than the VER693C0.



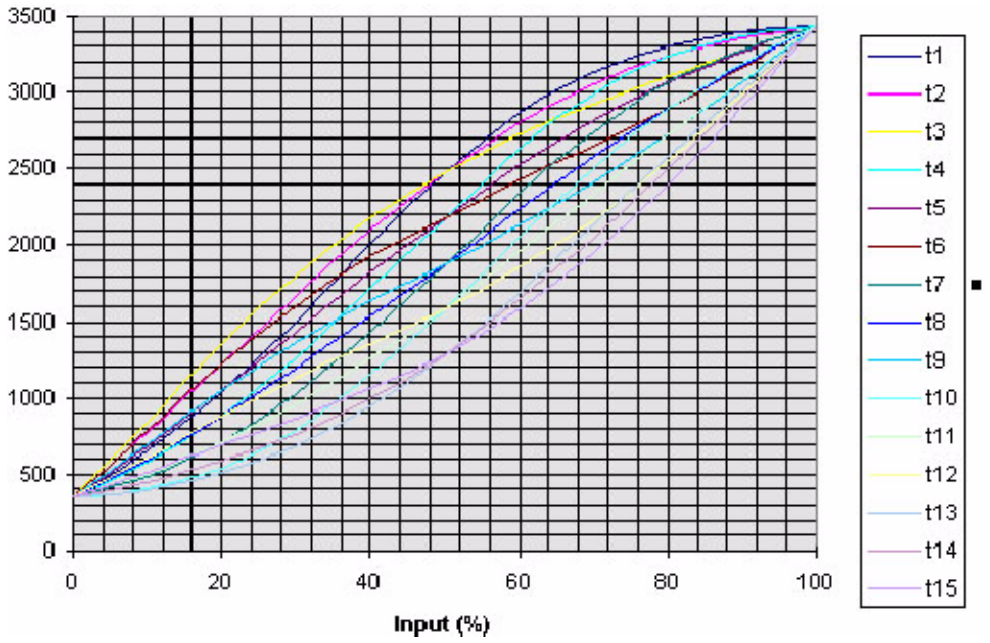
B3C5AX4: Allows moderate departures from the basic VER693C0 curves. Curves 2, 5, 8, 11 and 14 roughly cover the span of VER693C0. The remaining curves provide more mid−tone brightness choices. Curves 1, 4, 7, 10, and 13 = the brightest, and curves 3, 6, 9, 12, and 15 = the darkest. In all, there are 5 mid−tone contrast choices for each of 3 mid−tone brightness choices.

The plots on the chart indicate the two−dimensional brightness/contrast combinations provided by this TFT SET. The numbering of the TFTs in the set is such that when a 3 (horizontally) x 5 (vertically) contrast test film is printed, the printed images are of decreasing brightness going from left to right and increasing mid-tone contrast going from top to bottom on the film.

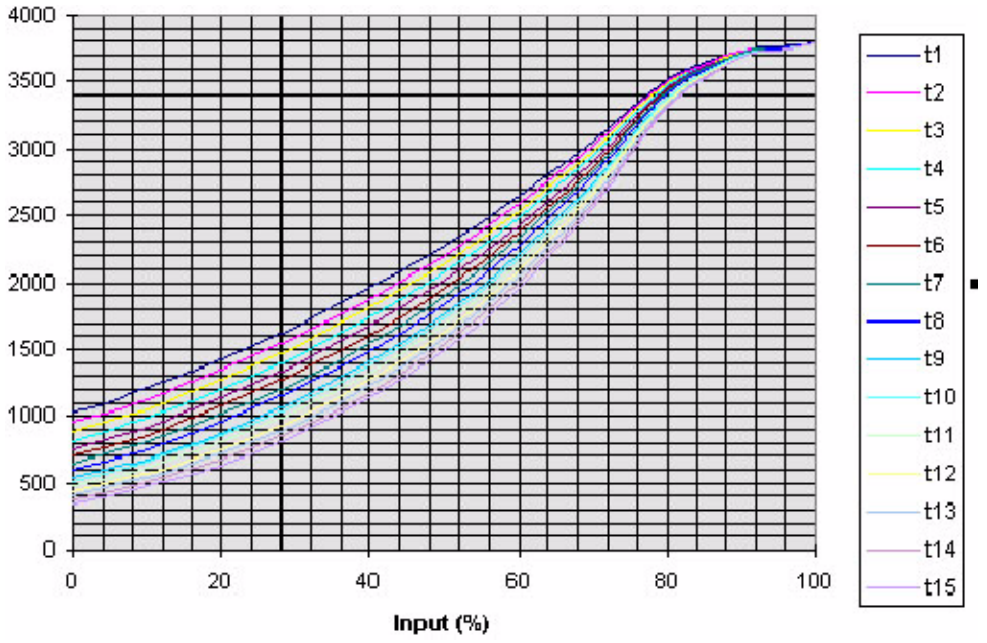


C3B5AX4: Allows moderate−to−strong departures from the basic VER693C0 curves. Curves 7 through 9 cover roughly the span of VER693C0 and the remaining curves provide more choices of mid−tone brightness. Curves 1 through 3 = the brightest, and curves 13 through 15 = the darkest. In all, there are 3 mid−tone contrast choices for each of 5 mid−tone brightness choices.

The plots on the chart indicate the two−dimensional brightness/contrast combinations provided by this TFT SET. The numbering of the TFTs in the SET is such that when a 3, horizontally, x 5, vertically, contrast test film is printed, the printed images are of decreasing brightness going from top to bottom and decreasing mid−tone contrast going from left to right on the film.

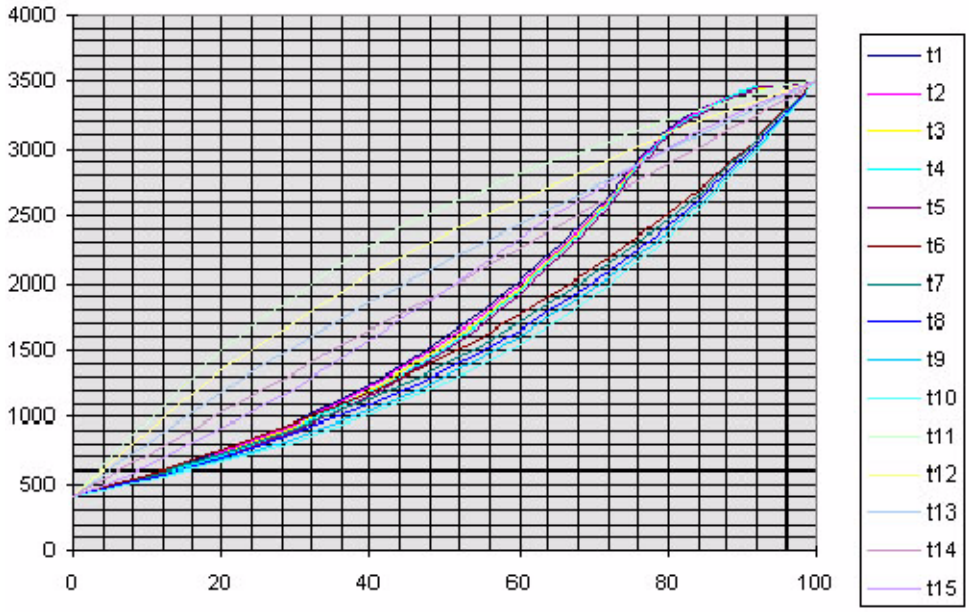


FCR302C4: Created specifically for use with the *3M* Model 2210 CREIB INTERFACE to a *Fuji* COMPUTED RADIOGRAPHY SYSTEM. This TFT SET should not be used for any other application. The 15 TFTs in this SET are designed to be used in correspondence with the 15 Dmax choices of the IMAGER, using Contrast 1 when the first Dmax value is used, etc. The plots in the chart below indicate a sagging shape, which is characteristic of a “linear in density” behavior, until maximum brightness (Dmin) is approached, at which point the curves become flat.



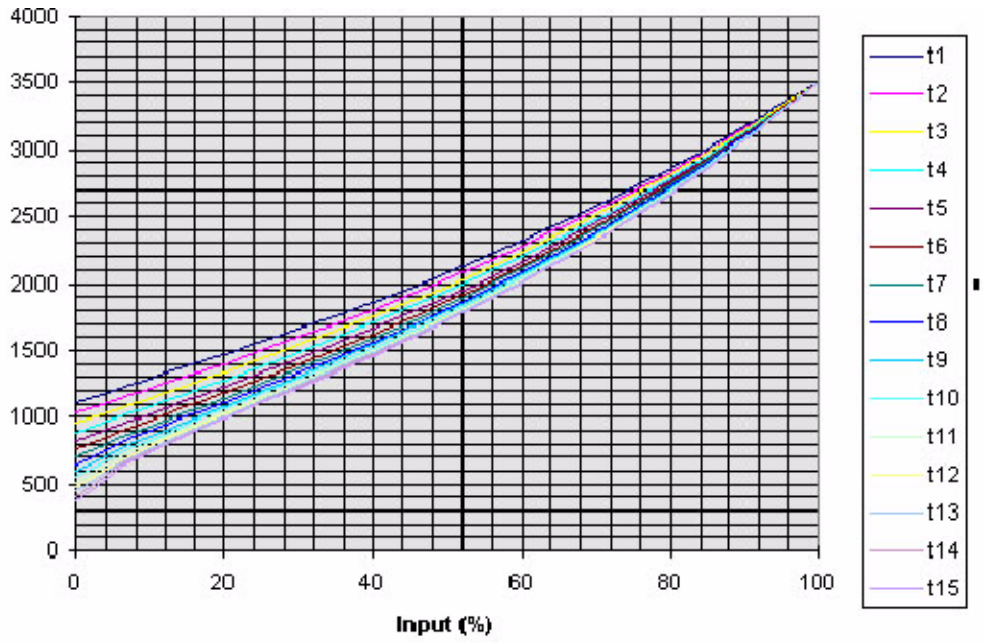
GEHYB01: A hybrid TFT SET that supports the various imaging MODALITIES which might be connected to a GE AMBER WORKSTATION. These MODALITIES include *Fuji* COMPUTED RADIOGRAPHY (CR), CT, MR, Ultrasound and any MODALITY that expects a linear–in–density PRINTER. The following table defines how the 15 TFTs can best be applied to the various MODALITIES supported by this TFT SET.

Contrast Value TFT No.	**Application**
1	*Fuji* CR, with Dmax = 2.6
2	*Fuji* CR, with Dmax = 2.7
3	*Fuj*i CR, with Dmax = 2.8
4	*Fuji* CR, with Dmax = 2.9
5	*Fuji* CR, with Dmax = 3.0
6	Linear in Density, Dmax = 2.6
7	Linear in Density, Dmax = 2.6
8	Linear in Density, Dmax = 2.6
9	Linear in Density, Dmax = 2.6
10	Linear in Density, Dmax = 2.6
11	Ultrasound – highest mid–tone brightness
12	Ultrasound – moderate mid–tone brightness
13	Ultrasound, CT or MR
14	CT or MR
15	CT or MR



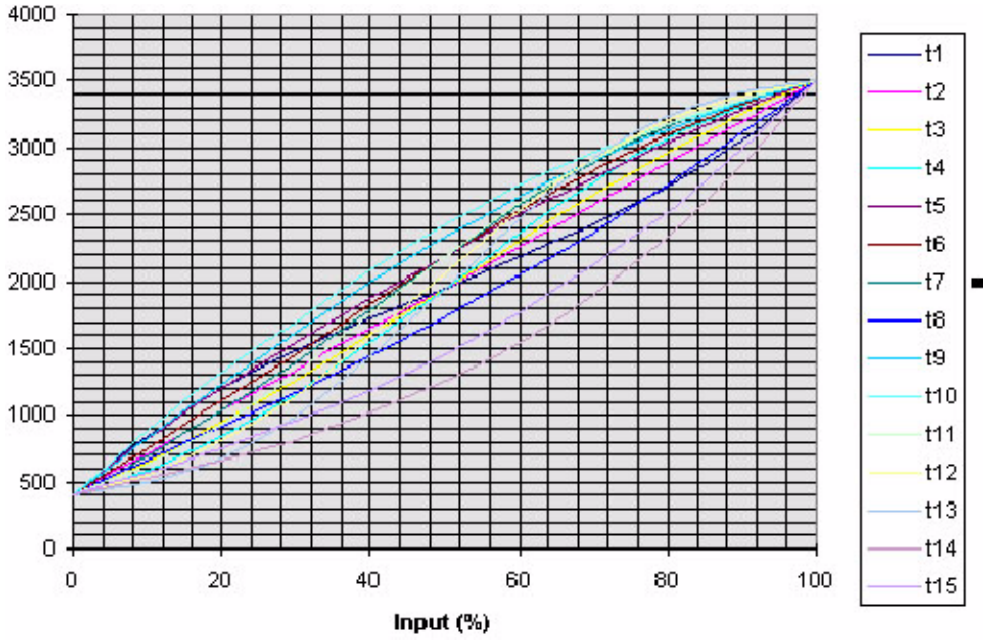
GSDF0: A TFT SET in which all 15 curves are designed to conform to the “NEMA Grayscale Standard Display Function” as applied to the case of transmissive film media under certain typical conditions. For optimum conformity with the standard, select the contrast value in this TFT SET based upon the Dmax value in the following table:

Dmax	Optimum Contrast Value
1.7	1
1.8	2
1.9	3
2.0	4
2.1	5
2.2	6
2.3	7
2.4	8
2.5	9
2.6	10
2.7	11
2.8	12
2.9	13
3.0	14
3.1	15

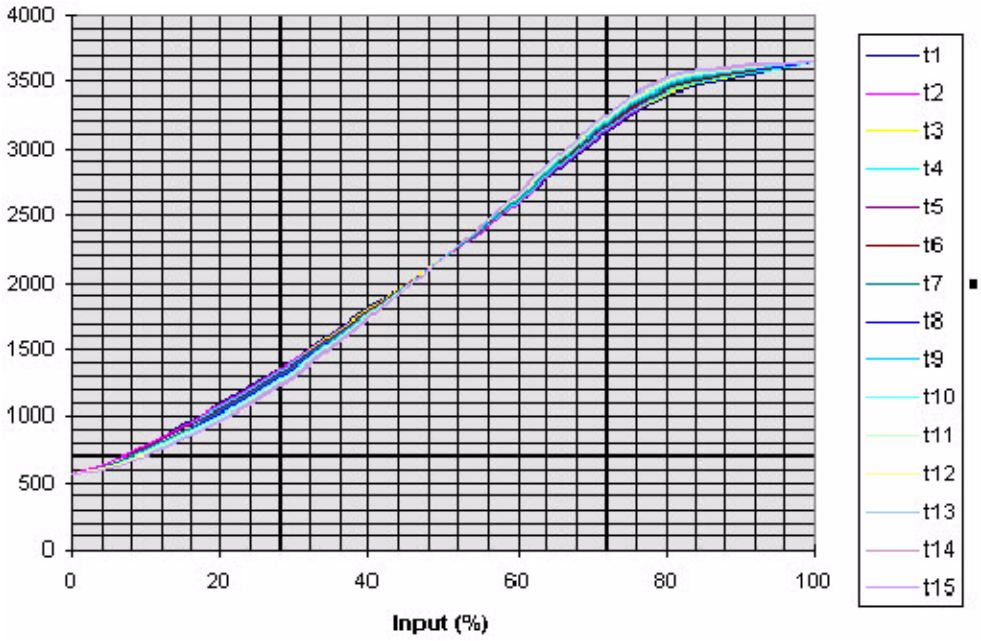


HYB60516: A hybrid TFT SET that supports the diverse needs of several imaging MODALITIES that might be operating within a Lockheed (formerly Loral) network. These MODALITIES include *Fuji* COMPUTED RADIOGRAPHY (CR), Digital Subtraction Angiography (DSA or DSI), C–ARM applications, CT, MR, Ultrasound and Nuclear Medicine. The following table defines how these 15 individual TFTs can best be applied to the needs of various imaging MODALITIES supported by this TFT SET

Imaging MODALITY	Suitable Dmax Range	Preferred Dmax	Suitable TFT Contrast Value	Preferred TFT Contrast Value
Fuji CR	2.7–3.0	3.0	2	2
DSI (DSA)	3.0	3.0	4–7	4
C–Arm	3.0	3.0	1–4	1
CT	3.0	3.0	2–7	2
MR	3.0	3.0	1–7	2
Ultrasound	2.5	2.5	3, 5–7, 11–15	9
Nuclear Medicine	2.3	2.3		12



MAXXUS: Created specifically for use with the YMS SPECT to match Konica film. All 15 curves are very close to a single curve. The MAXXUS TFT SET provides a SET of tables suitable for certain nuclear medicine applications, specifically, to provide a flat, low contrast, curve shape in the brightest portions of an image. This minimizes the visibility of soft tissue in a bone nuclear medicine image in which bone is printed black on a white background. This is a tight TFT SET, offering limited variation with contrast value.



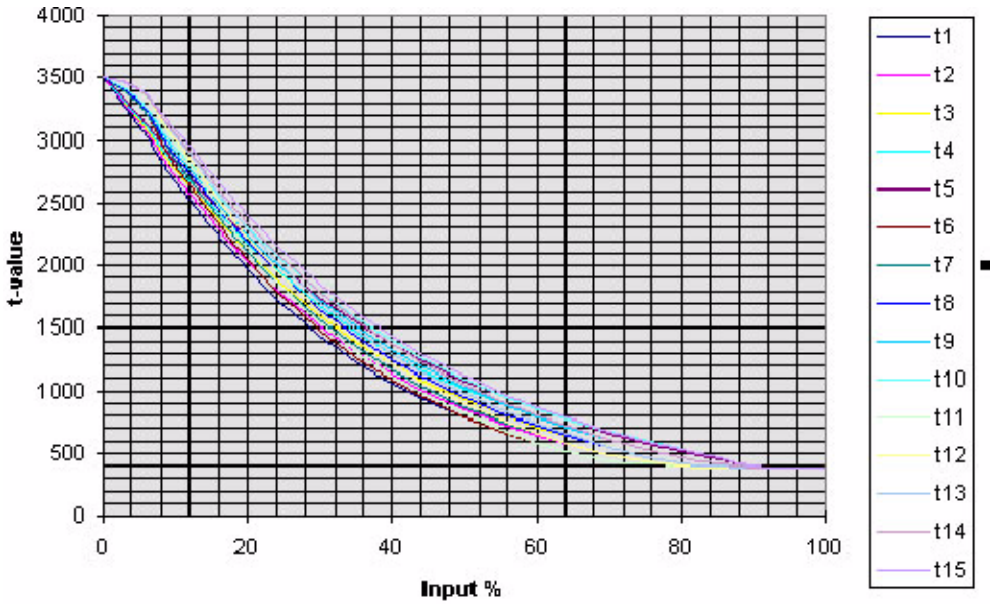
MSFDUP1: Designed to meet the density printing requirements of a TFT-based LASER IMAGER for Kodak that is used as the PRINTER in a Kodak DUPLICATOR equipped with a MULTI-SHEET FEEDER. The 15 individual TFTs of this TFT SET are designed to map 15 different Dmin and Dmax nominal input ranges, original film, into the full density range of the IMAGER, approximately 0.2 to 3.1, for blue film.

Example: If the original film is a blue-based film from a LASER IMAGER, with a film Dmin of about 0.2 and a printed Dmax of about 3.0, a reasonable contrast value for duplicating this film would be 11. Since these input density ranges are approximate, other similar values, 6 in this example, could give optimal results from a user perspective. See the following table of nominal contrast values.

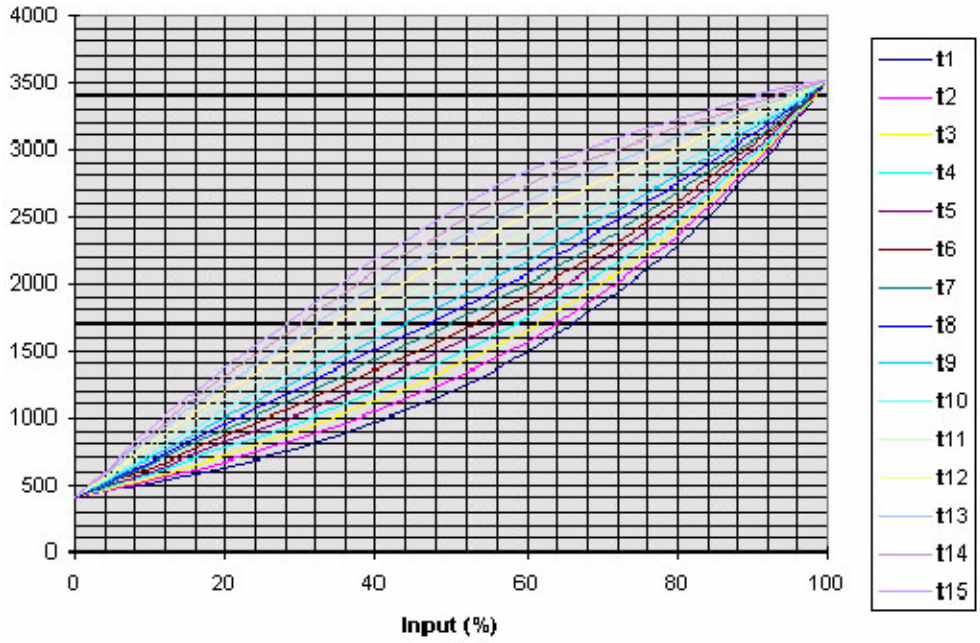
Nominal Contrast Values*

Dmin	Dmax ~ 3.0	Dmax ~ 3.2	Dmax ~ 3.4	Dmax ~3.6	Dmax ~ 3.8
~ 0.05	C = 1	C = 2	C = 3	C = 4	C = 5
~ 0.12	C = 6	C = 7	C = 8	C = 9	C = 10
~ 0.20	C = 11	C = 12	C = 13	C = 14	C = 15

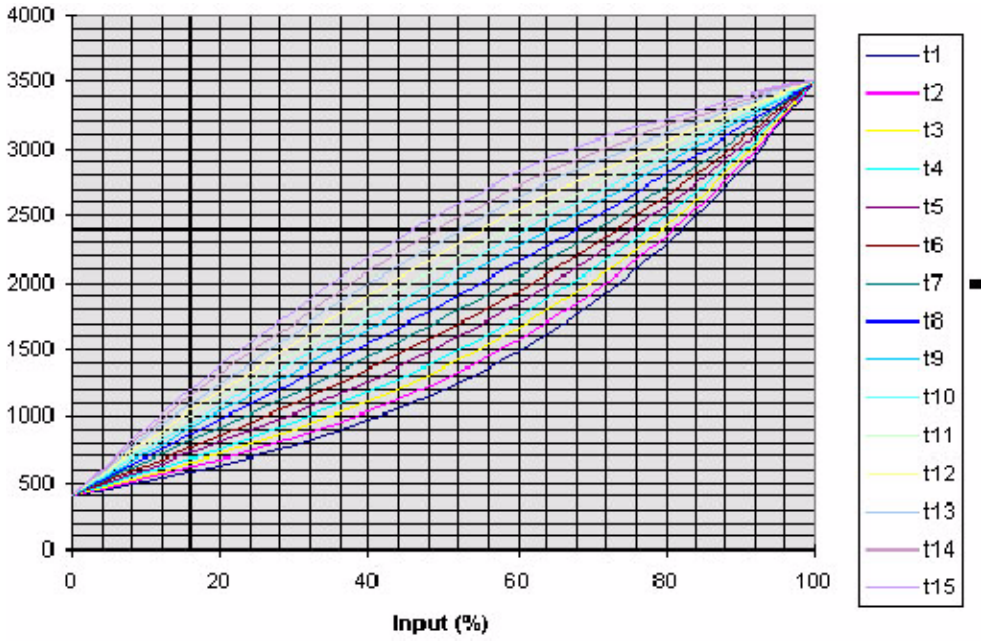
* For various original film density ranges.



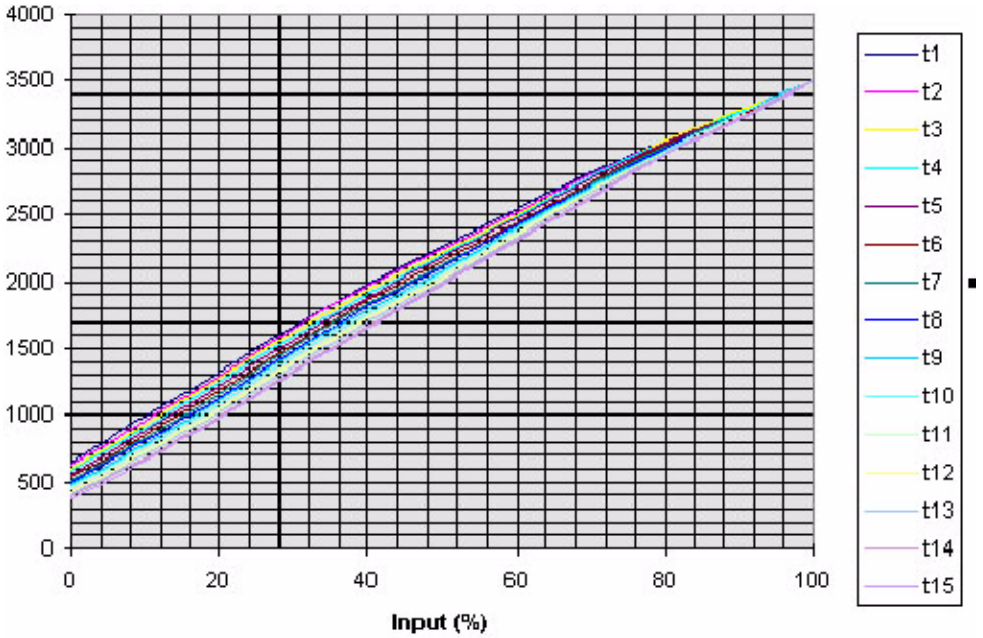
PMSB: Developed as a modification to the PMSV3K TFT SET that was previously developed for Philips MEDICAL SYSTEMS. This SET was made by adjusting the t–values within the PMSV3K TFT SET so that when using Contrast 9 of the PMSB TFT SET match, the densities print, as correctly as possible, the latest target densities requested by Philips MEDICAL SYSTEMS. All 15 of these tables have the same mid–tone contrast, or slope, but have a wide variety of brightnesses, with contrast value 1 = the darkest image and contrast value 15 = the brightest.



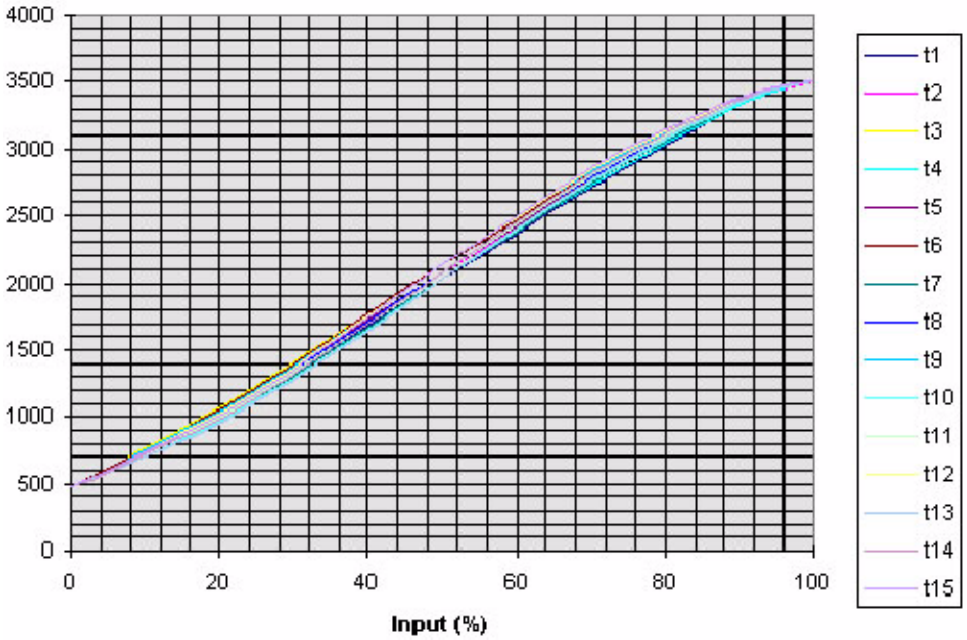
PMSV3K: A SET of non-S-curve TFTs, with mid-tone density gradually decreasing as the TFT number, or contrast value, is increased. This SET was originally requested by Philips MEDICAL SYSTEMS who preferred “saggy curve” shapes to the “S-shaped” curves of VER693C0 and VER713C0. All 15 of these tables have the same mid-tone contrast, or slope, but have a wide variety of brightnesses, with contrast value 1 = the darkest image and contrast value 15 = the brightest.



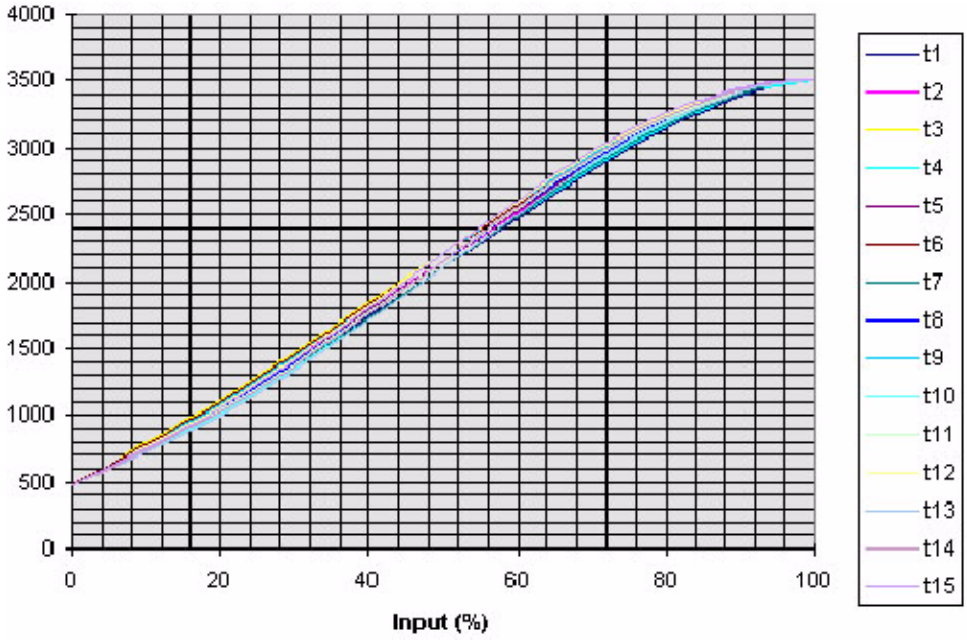
SFH301A4: Composed of 15 non-S-curves, designed specifically for the *Siemens Fluorospot* H SYSTEM. The plots on the chart below indicate a shape that is approximately “linear in brightness”, with the different minimum t-values corresponding to the different selectable Dmax values.



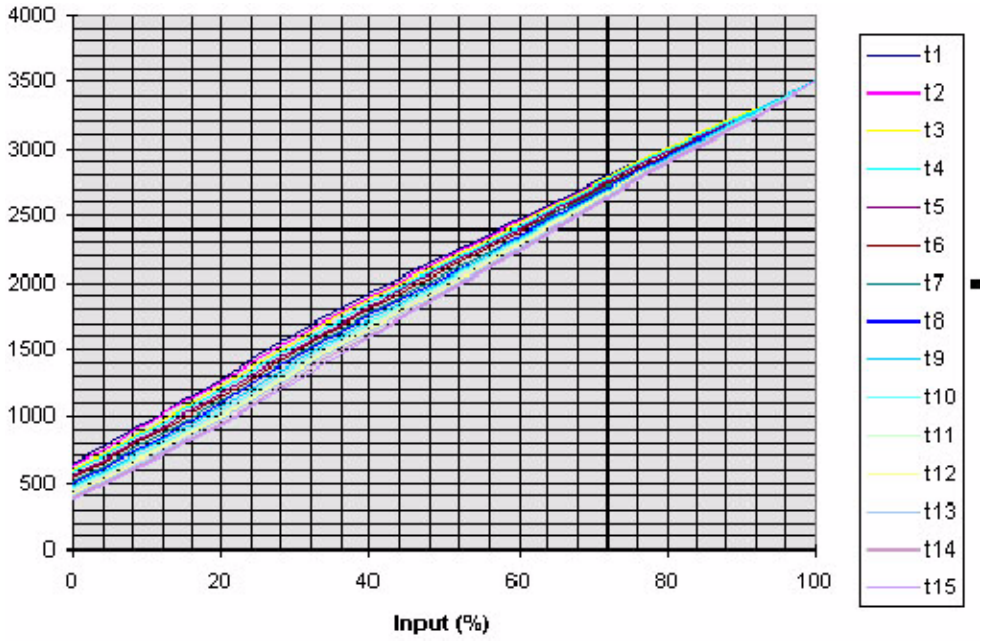
SIECT87: A SET in which all 15 curves are very close to a single, Siemens defined curve for CT. The following plots of this TFT SET indicate a shape which is close to a “linear in brightness” shape and is similar to the slightly S–shaped middle TFTs of the VER693C0 TFT SET. But unlike the VER693C0 SET, this TFT SET is not designed to provide a significant range of variability to the user, but rather a small range of variability to allow a single predefined table to be matched as closely as possible.



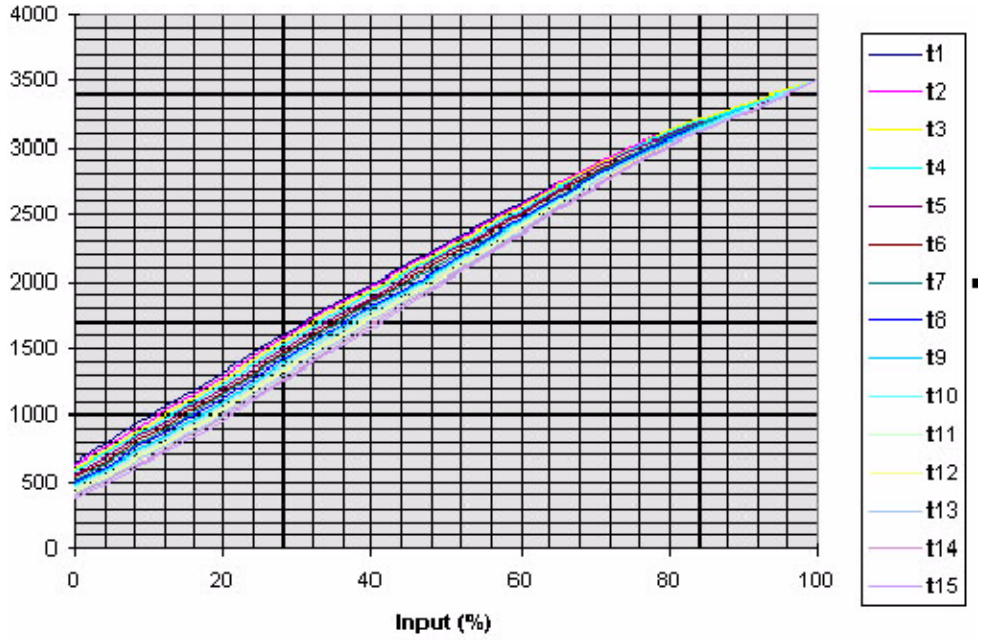
SIECT87B: A slight modification to the SIECT87 TFT SET, designed to match, as closely as possible, the Siemens requirements for CT.



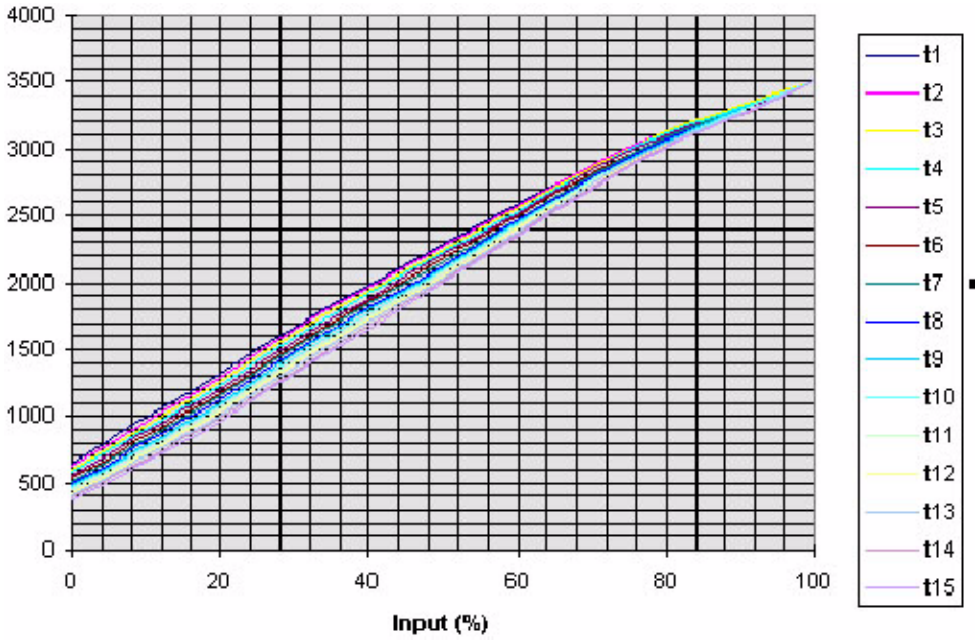
SIEFC969: Designed to satisfy the requirements of Siemens for use with the *Fluorospot* COMPACT modality. The t–values in this TFT SET are similar to the values defined for the SFH301A4 TFT SET, but the SIEFC969 values have been adjusted to optimally meet the needs of the *Fluorscope* COMPACT. The t–value plots below indicate a shape that is approximately “linear in brightness”, with the different minimum t–values corresponding to the different selectable Dmax values.



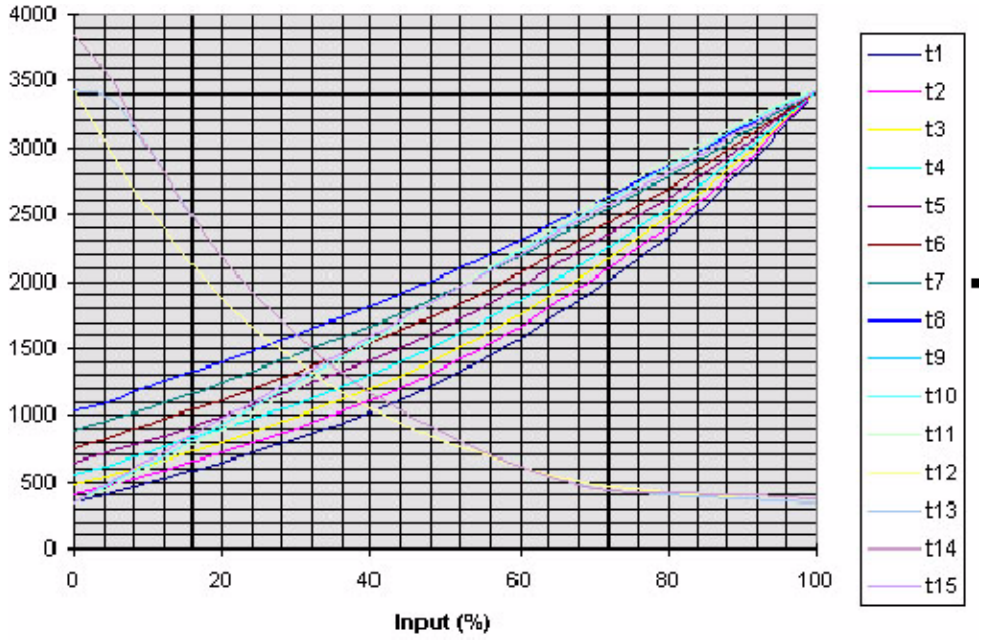
SIEFL87B: A slight modification to the SFH301A4 TFT SET, designed to match, as closely as possible, the Siemens requirements for *Fluorospot* DSA. The t–value plots below indicate a shape that is approximately “linear in brightness,” with the different minimum t–values corresponding to the different selectable Dmax values.



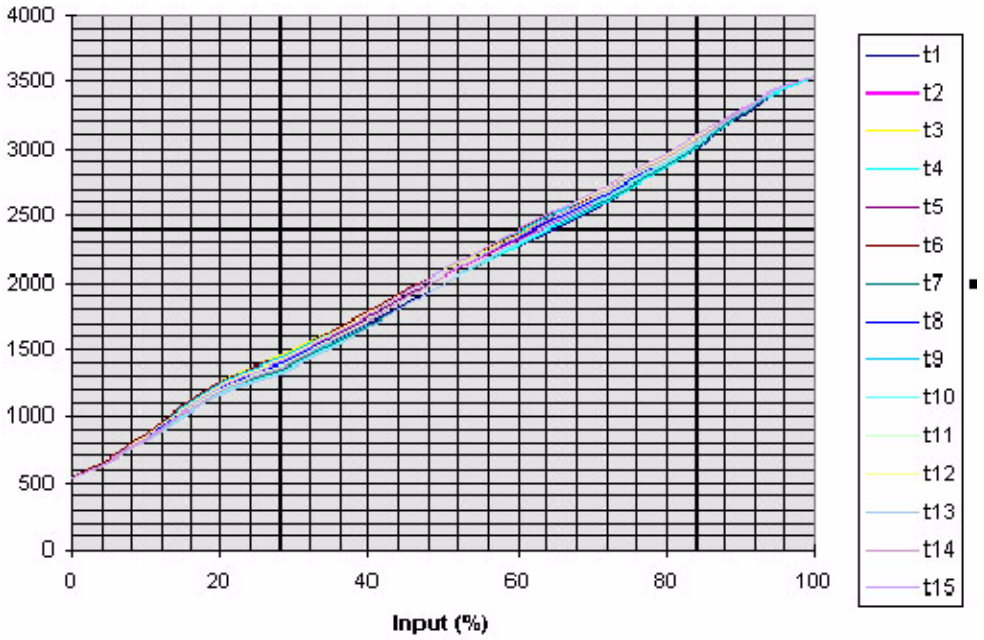
SIEFL87C: A slight modification to the SIEFL87B TFT SET, designed to match, as closely as possible, the latest Siemens requirements for the *Fluorospot* DSA.



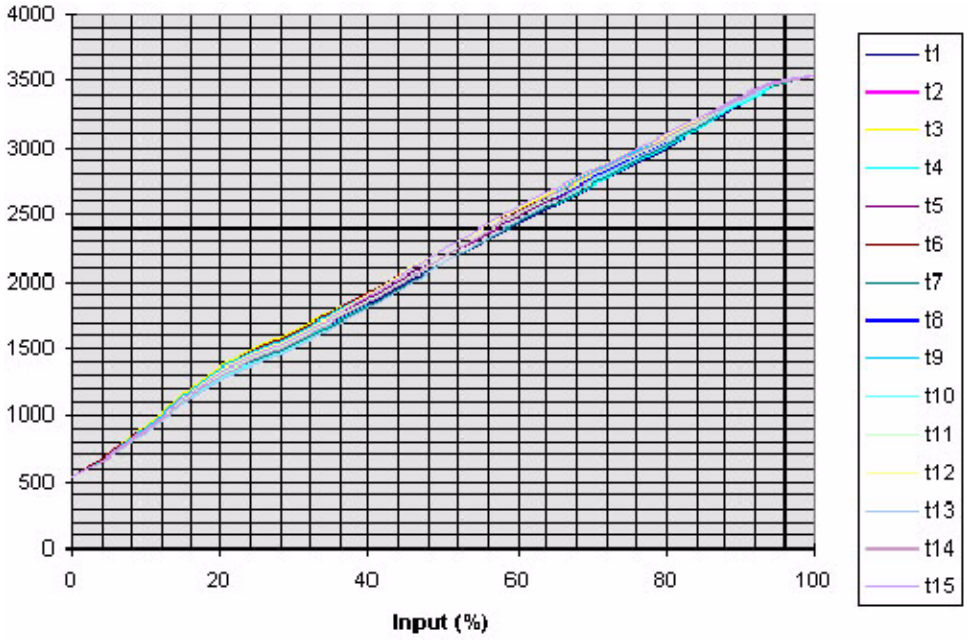
SIEFLTOP: A slight modification to the SIEWS87B TFT SET, designed to match, as closely as possible, the Siemens requirements for Fluorospot TOP SYSTEMS.



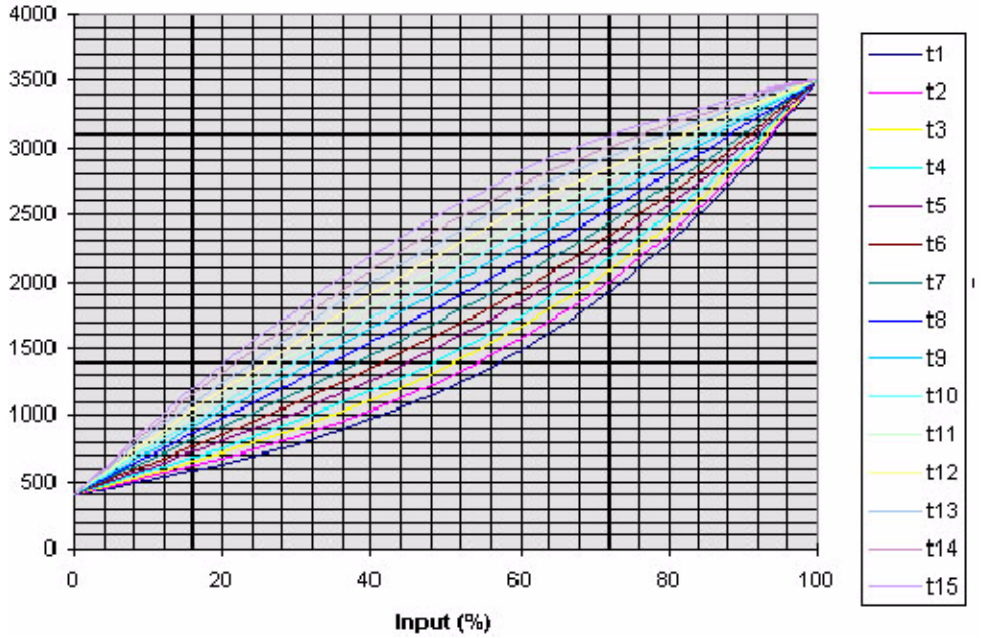
SIEMR87: A SET in which all 15 curves are very close to a single, Siemens defined curve for MR. The t–value plots in the chart below indicate a shape which is like a “linear in brightness” shape, but with more undulations than the slightly S–shaped middle TFTs of the VER693C0 TFT SET. As with the SIECT87 TFT SET, the SIEMR87 TFT SET is not designed to provide a significant range of variability to the user, but rather a small range of variability to allow a single predefined table to be matched as closely as possible.



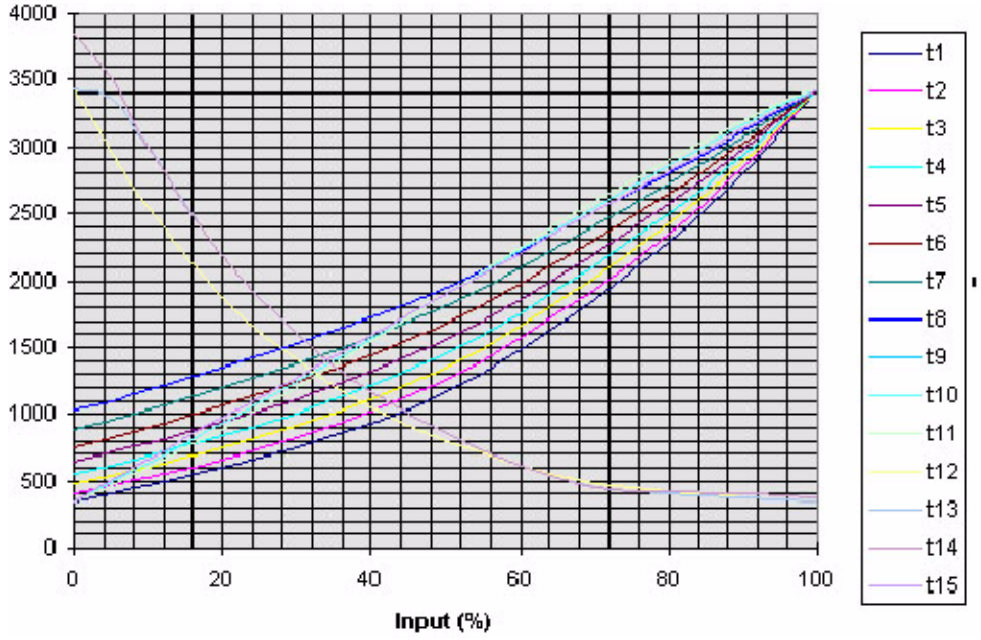
SIEMR87B: A slight modification to the SIEMR87 TFT SET, designed to match, as closely as possible, the Siemens requirements for MR.



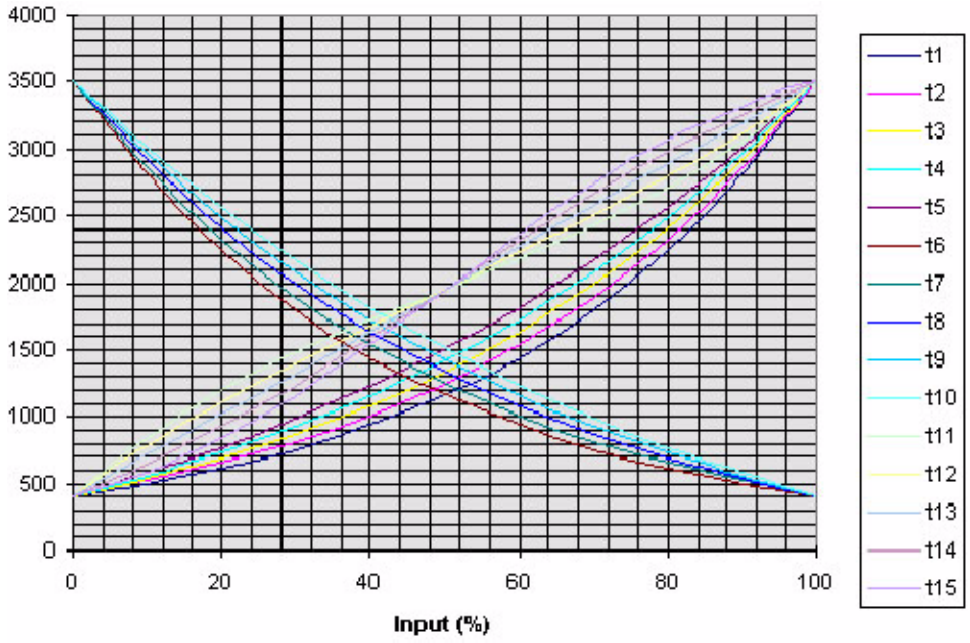
SIEPOLY: Equivalent to the PMSV3K TFT SET, designed to match, as closely as possible, the Siemens requirements for installations of the *Siemens Polytron*/8700.



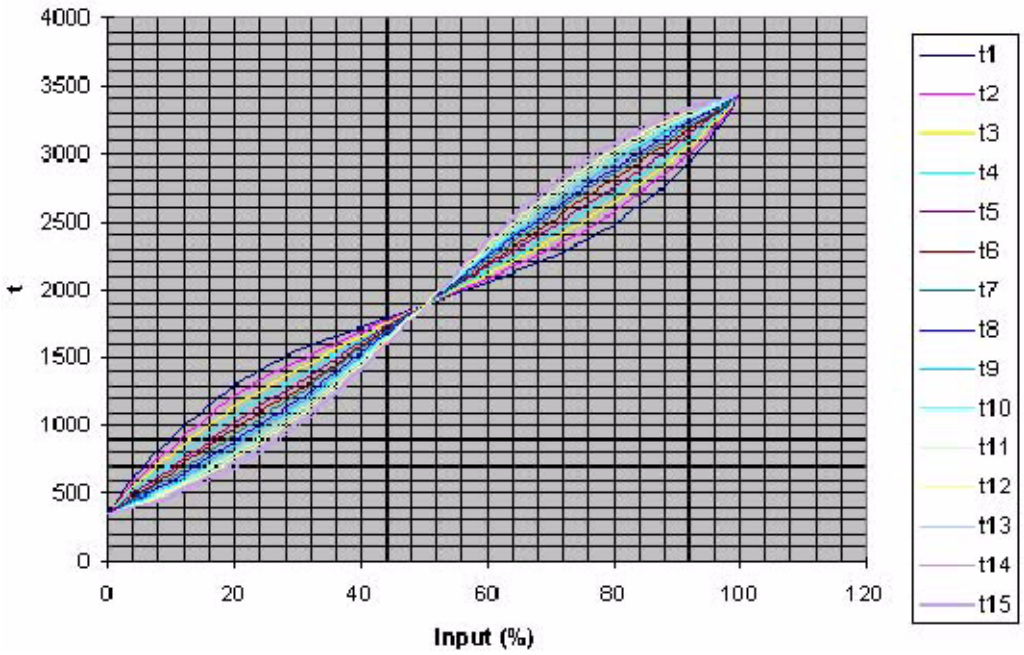
SIEWS87B: A slight modification to the WRKSTN2A TFT SET, designed to match, as closely as possible, the Siemens requirements for the *Sienet* WORKSTATION.



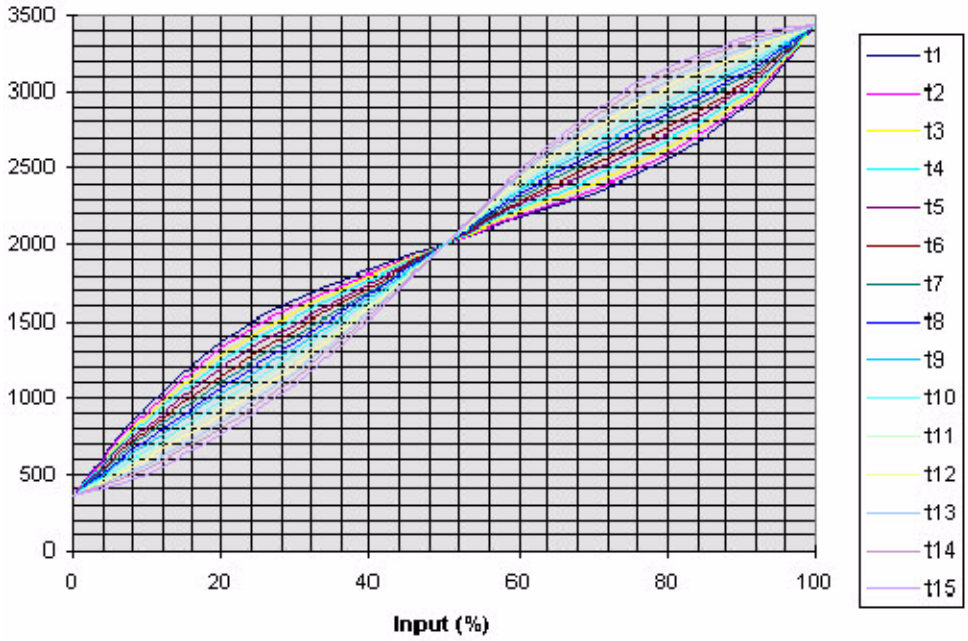
TLII: Created for use with the *Toshiba* LASER IMAGER INTERFACE (TLII) for Nuclear Medicine applications. It provides several linear–in–density curves, 5 with increasing density plus 5 with decreasing density. It also provides 5 approximately linear–in–brightness curves, similar to some of the VER693C0 curves, for an MR MODALITY, *Toshiba* FLEXART. The combination of diverse curve shapes in this TFT SET, for different MODALITIES, makes it an example of a hybrid TFT SET.



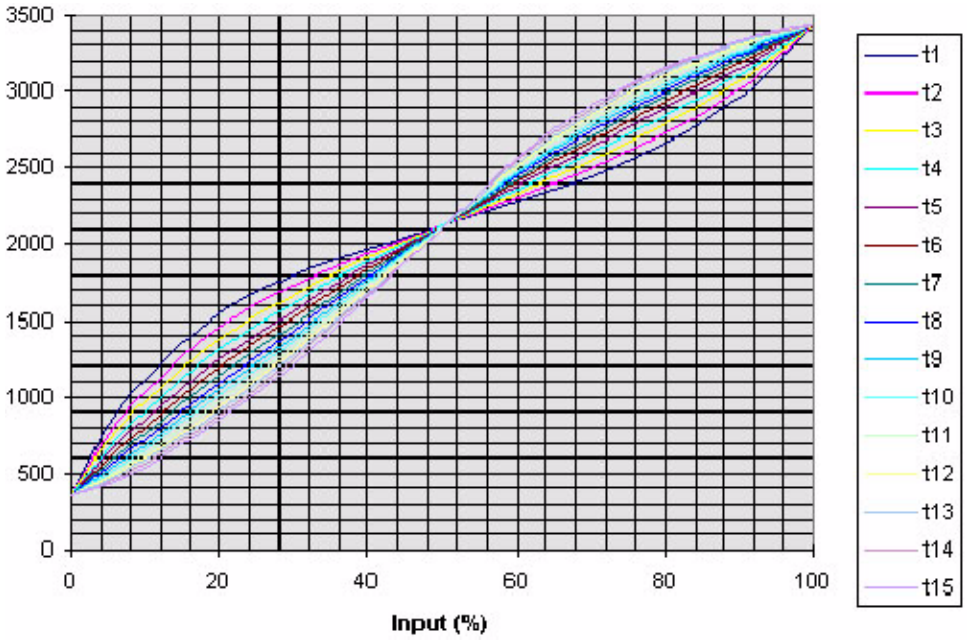
VER693C0: A popular, general–purpose TFT SET of S–shaped curves, widely used for CT, MR and certain other MODALITIES. Curve 6 of this SET is designed to be linear–in–perceived–brightness. Contrast values below 6 give increased contrast, or slope, next to the end points and decreased "mid–tone" contrast, near 50% of digital input. Contrast values above 6 give decreased contrast near the end points and increased mid–tone contrast. The following plots of this TFT SET indicate that all 15 of the tables have the same mid–tone brightness, with varying degrees of an S–shape contribution which gives the strongest end–points contrast, or slope, to Table 1 and the strongest mid–tone contrast, or slope, to Table 15.



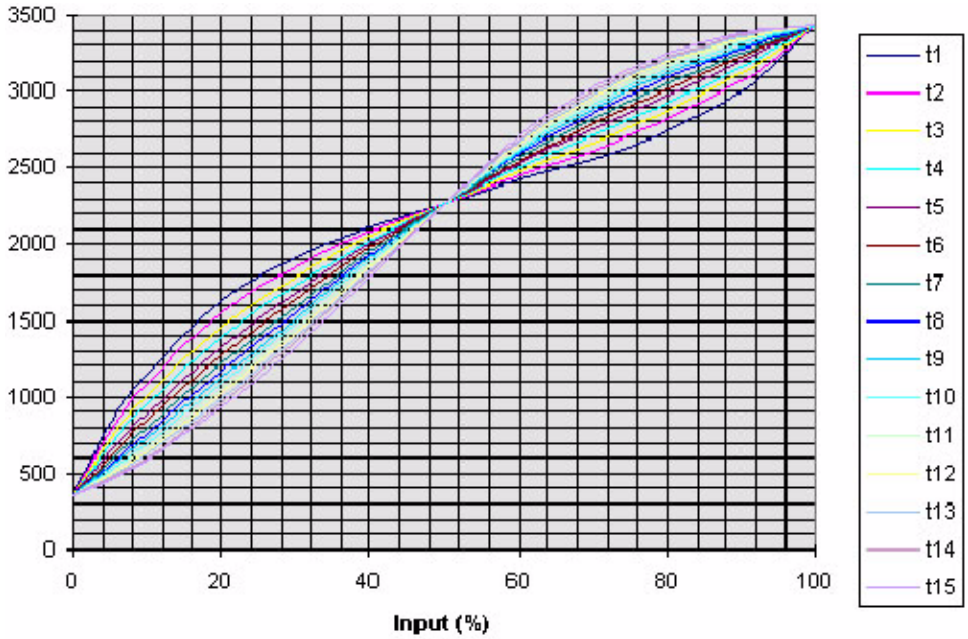
VER703C0: Created to provide a SET of S–shaped curve choices that are intermediate in perceived brightness, between those of VER693C0 TFT SET and those of VER713C0 TFT SET. All 15 of these tables have the same mid–tone brightness, which is slightly brighter than the mid–tone brightness of the VER693C0 tables and slightly darker than the mid–tone brightness of the VER713C0 TFT SET. As with the VER693C0 and VER713C0 TFT SETS, there are varying degrees of an S–shape contribution which gives the strongest end–points contrast, or slope, to Table 1 and the strongest mid–tone contrast, or slope, to Table 15.



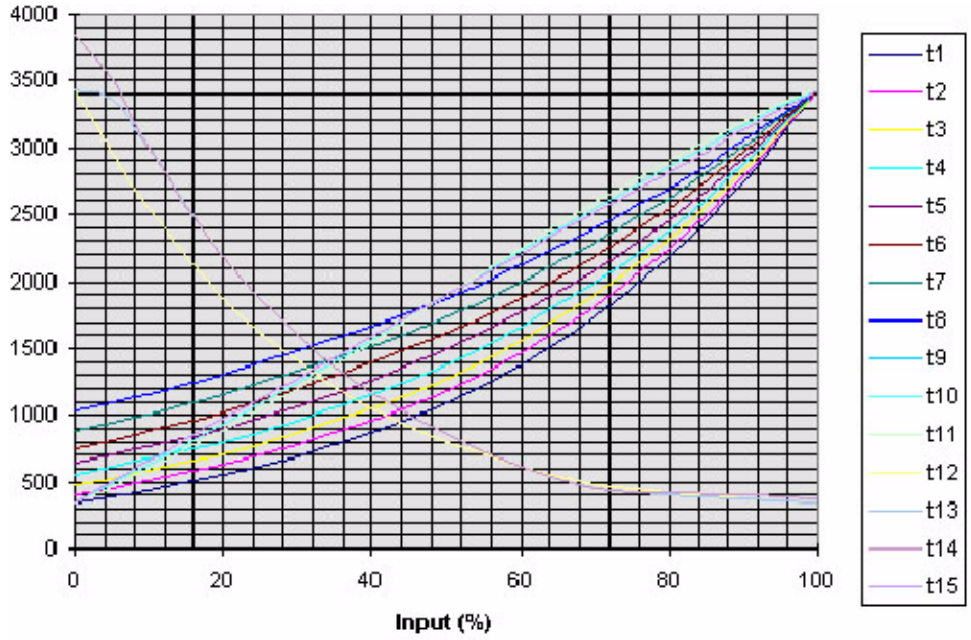
VER713C0: Nearly as popular as the VER693C0 SET, with a lower mid–tone density than the VER693C0 SET. This SET is similar to the VER693C0 TFT SET, but with a slight increase in brightness, i.e., the VER713C0 TFT SET can be characterized as having slightly lower “mid–tone density” than the VER693C0 TFT SET. All 15 of these tables have the same mid–tone brightness, which is brighter than the mid–tone brightness of the VER693C0 tables. As with the VER693C0 TFT SET, there are varying degrees of an S–shape contribution which gives the strongest end–points contrast, or slope, to Table 1 and the strongest mid–tone contrast, or slope, to Table 15.



VER723C0: Designed to offer another choice of curves, similar to the S–shaped curves of VER713C0, but at a brightness higher than VER713C0, which is brighter than VER703C0, which is brighter than VER693C0. This choice is necessary at certain customer sites, e.g., at *GE* CT–I sites where higher brightness is desired for mid–brain gray/white matter and/or abdominal soft tissue.



WRKSTN2A: Designed for post−processing IMAGING WORKSTATIONS in which curves 1 through 8 are designed to produce linear in optical density results on film, for density values of 3.2 through 1.8, respectively. Curves 9 through 11 are the same as VER693C0 curves 6 through 8. Curves 12 through 14 are designed for film DIGITIZER applications. Curve 15 is the same as curve 9.



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Section 3 – Adjustments

3-1. Setting Temperature of the PROCESSOR DRUM

This procedure must be performed whenever the PROCESSOR ASSEMBLY or PROCESSOR DRUM is replaced, whenever the MCS BOARD is replaced, or if DRUM temperatures are suspected of causing image quality problems.

Specification

The temperature measured at the PROCESSOR DRUM must be in the range 123.5° – 124.5° C (254.3° – 256° F).

Special Tools

TEMPERATURE METER with PROBE TL5574
BLOCK FOR PROBE, KIT SP7F3477
LAPTOP COMPUTER with *Microsoft* INTERNET EXPLORER 5.5
SERVICE TOOL
Ethernet PATCH CABLE (straight–through) TL5576

Note

A TEMPERATURE METER and PROBE with a BAR TYPE ELEMENT must be used to perform this procedure. PROBES with CIRCULAR TYPE ELEMENTS will not provide accurate readings. The TEMPERATURE METER and PROBE must be calibrated together as a pair at least once per year. If the PROBE breaks, a new PROBE and the METER must be sent in for calibration. See paragraph 5-2 for details.

Note

The TEMPERATURE METER must be at room temperature when performing this procedure. If the METER has been brought in from a hot or cold vehicle, allow it to acclimate to room temperature.

Measurement Setup

1. Energize the IMAGER and allow it to warm to operating temperature (READY).
2. Prepare the TEMPERATURE METER for use:
   a. Install the BLOCK on the TEMPERATURE METER PROBE as shown in Figure 3-1.
   b. Clean the PROBE with alcohol.
   c. Set the TEMPERATURE METER to display in Celsius (C).

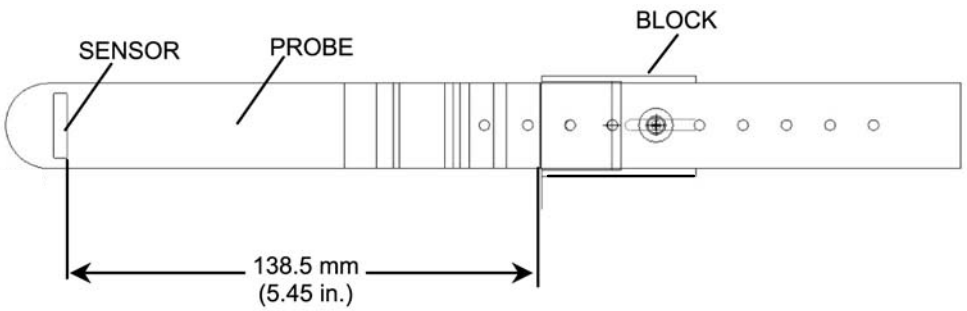


Figure 3-1. Positioning the TEMPERATURE PROBE BLOCK

3. Lift the UPPER HOOD and set the SERVICE SWITCH in the Service position.

Measurement

1. Release the CLAMPS on the PROCESSOR COVER.
2. Open the PROCESSOR COVER.

Caution

Hot Surface

The PROCESSOR DRUM and ROLLERS are hot. Take care when working in the area of the PROCESSOR.

3. Lay the PROBE across the top of the DRUM at the center of the DRUM.
4. Close the COVER with the BLOCK positioned against the BACK PLATE and just below the COVER HANDLE.
5. Latch the COVER.
6. Allow the temperature reading on the METER to stabilize. This should take about 90 ± 15 seconds.
7. Check that the METER indicates 123.5° to 124.5° C. If it does not, perform the following adjustment.

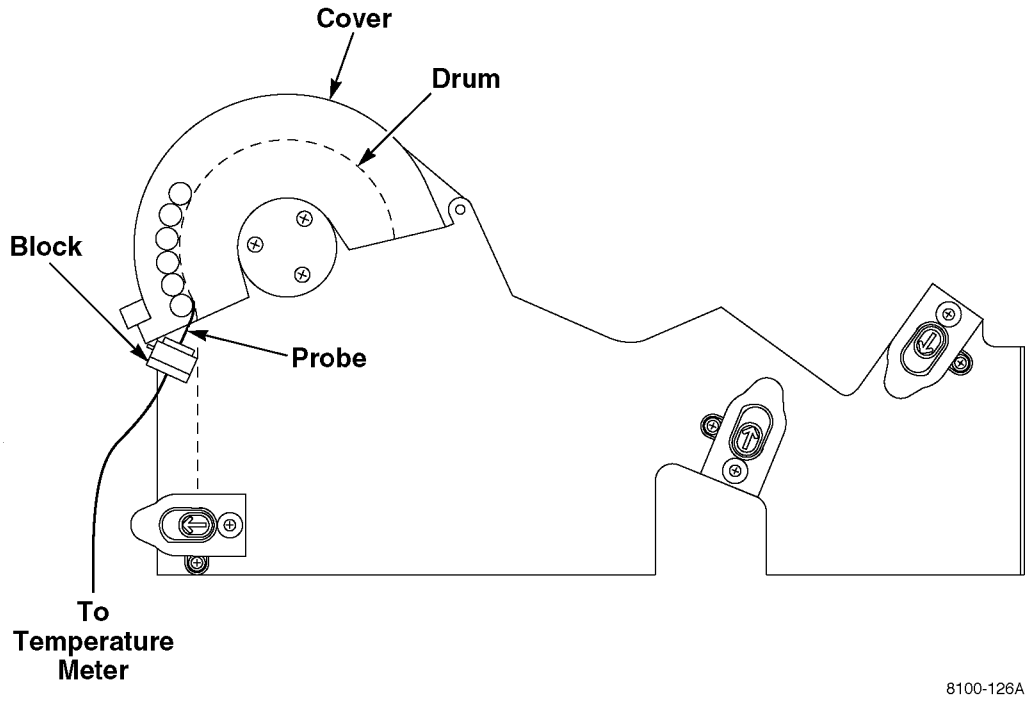
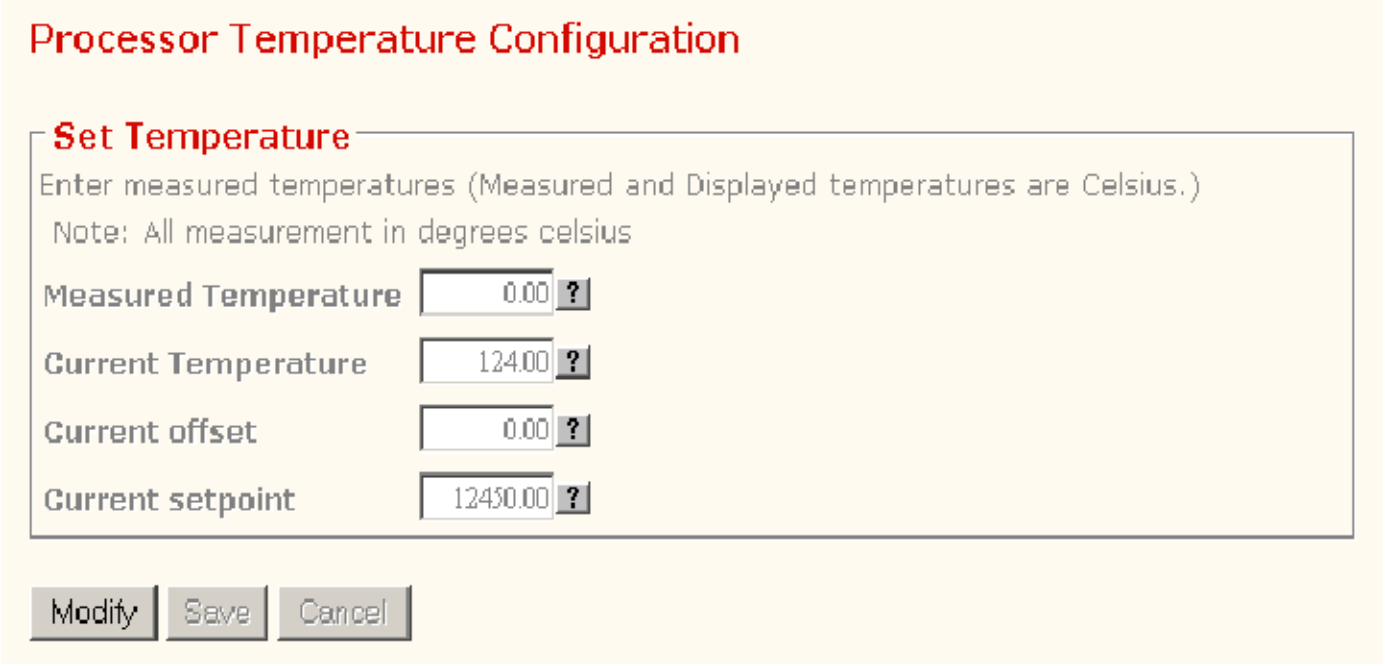


Figure 3-2. Positioning the TEMPERATURE PROBE

Adjustment

1. Use a PATCH CABLE to connect your LAPTOP COMPUTER to the Service Port under the TOP HOOD.
2. Energize the LAPTOP COMPUTER.
3. Connect to the SERVICE TOOL through SecureLink.
4. Access the SERVICE TOOL main menu through the WebLink.
5. Select **Configuration>MCS>Processor**.



6. Click [Modify].
7. In the “Measured Temperature” window, type the temperature value measured by the METER.

Note

The “Current offset” window indicates the “offset” between the Current Temperature value in the PROCESSOR MICRO and the Measured Temperature.

8. Click [Save].
9. Close the “Processor Temperature Configuration” window.
10. Allow approximately 10 minutes for the temperature of the DRUM to stabilize.
11. Use the METER to check the temperature of the DRUM again. The temperature must be 123.5° – 124.5° C (254.3° – 256° F).

3-2. PROCESSOR DRUM RTD

Caution

The following calibration procedure is done at the manufacturing site, and should rarely have to be performed in the field. It is included here for reference. DO NOT perform this procedure unless directed to do so by Service Engineering. Misadjustment can cause additional machine problems.

Specification

Output of the Voltage–to–Frequency Converter on the MCS BOARD (TP1) is 99.5 to 100.5 Khz.

Special Tools

Calibrated DIGITAL MULTIMETER with frequency measurement capability (e.g., Fluke 87) or an OSCILLOSCOPE
PORT ADJUSTMENT TOOL

Adjustment

1. Remove the REAR PANEL and set the SERVICE SWITCH in the Service position.
2. With power off, remove the CONNECTOR PLUG from J17 on the MCS BOARD. (This disconnects the RTD from the circuit.)
3. Attach a JUMPER to pins 1 and 2 (Calibrate).
4. Connect the DIGITAL MULTIMETER, set to measure frequency, or an OSCILLOSCOPE to TPI (+ lead) and AGND1 (– lead).
5. Adjust POT VR1 on the MCS BOARD so the measured frequency is 99.5 to 100.5 KHz.
6. Power off. Remove JUMPER, reconnect the RTD CONNECTOR PLUG to J17, set the SERVICE SWITCH to its normal operating position, and replace the REAR PANEL.

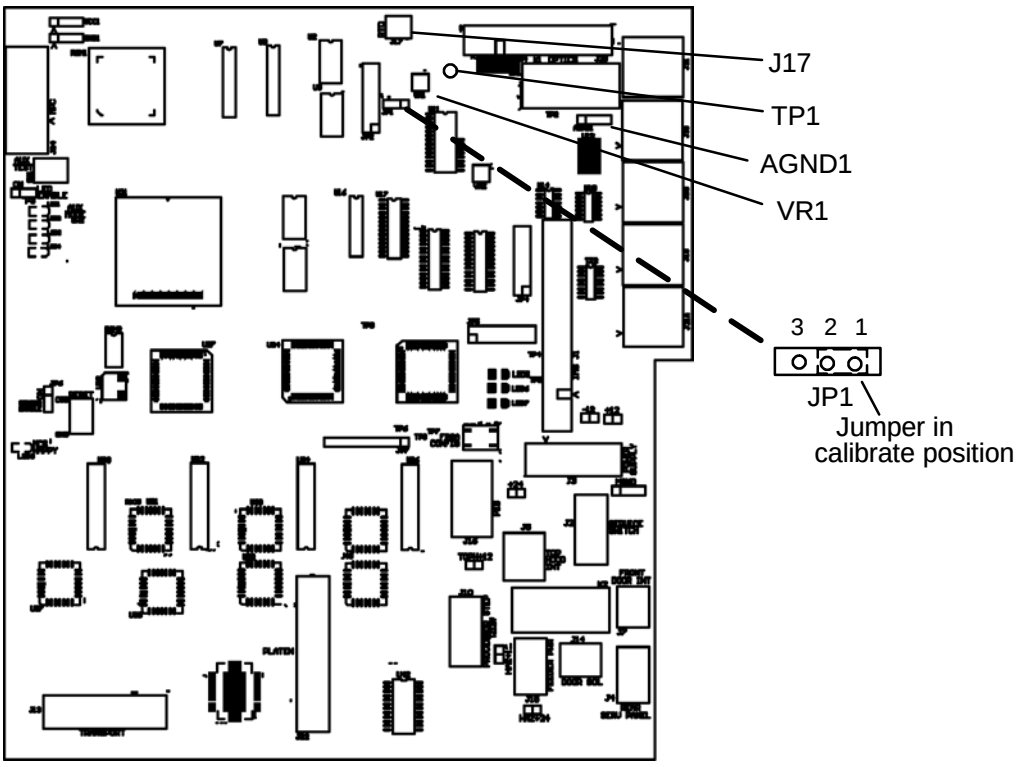


Figure 3-3. Calibrating the PROCESSOR DRUM RTD

3-3. PROCESSOR FILM DIVERTER ASSEMBLY (STRIPPER)

Specification

Gap between DIVERTER BLADE and DRUM END CAPS must be 0.38 to 0.50 mm (0.015 to 0.020 in.). The DRUM must be at operating temperature for valid check and adjustment.

Required Tools

FEELER GAUGES
M2.5 ALLEN WRENCH

Measurement

1. Raise the UPPER HOOD.
2. Release the 2 DRUM COVER LATCHES and open the DRUM COVER.

Caution

The HEAT SHIELD and the surface of the PROCESSOR DRUM are hot. Take care in handling.

3. Use a FEELER GAUGE to check the gap between the DIVERTER and END CAPS of the DRUM. It must be 0.38 to 0.50 mm (0.015 to 0.020 in.).
4. Rotate the DRUM and check gap consistency around the DRUM.

Adjustment

1. Close the DRUM COVER.
2. Carefully remove and set aside the HEAT SHIELD.
3. Loosen the 2 DIVERTER ATTACHING SCREWS (see Figure 3-4).
4. Set the gap between the DIVERTER and END CAPS of the DRUM to the specification. (You will have to open the DRUM COVER to check the gap.)

Note

To avoid having to open and close the DRUM COVER for check and adjustment, you may wish to remove the DRUM COVER. (Use a 2.5 ALLEN WRENCH.)

5. Tighten the 2 DIVERTER ATTACHING SCREWS and recheck the gap. Readjust as necessary.
6. Replace the HEAT SHIELD and close and latch the DRUM COVER.

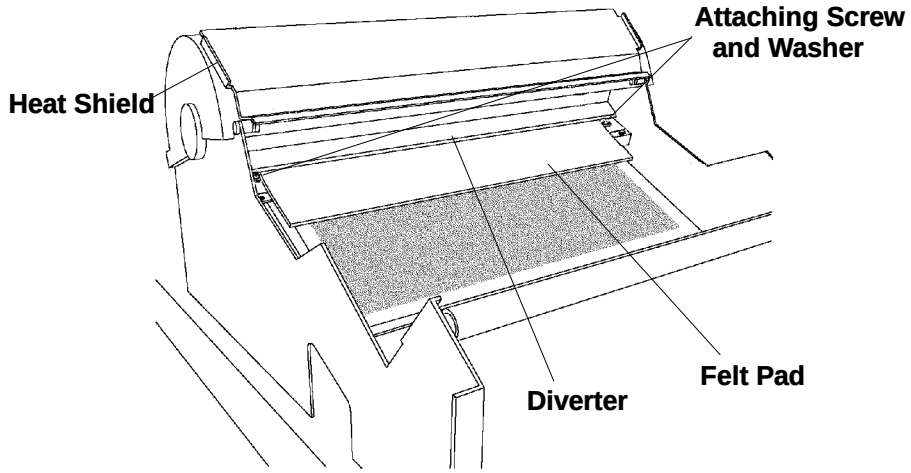


Figure 3-4. Adjusting the FILM DIVERTER BLADE GAP

3-4. Optics Translation Speed and SOP Delay

This adjustment must be performed if any of the following is replaced; the TRANSLATION MOTOR, the FILM CENTERING MOTOR, the OPTICS HOME SENSOR, or the OPTICS MODULE. If translation speed is too fast, the image may appear stretched. If Start of Page (SOP) is out of adjustment, the image will be shifted right or left on the page.

Specification

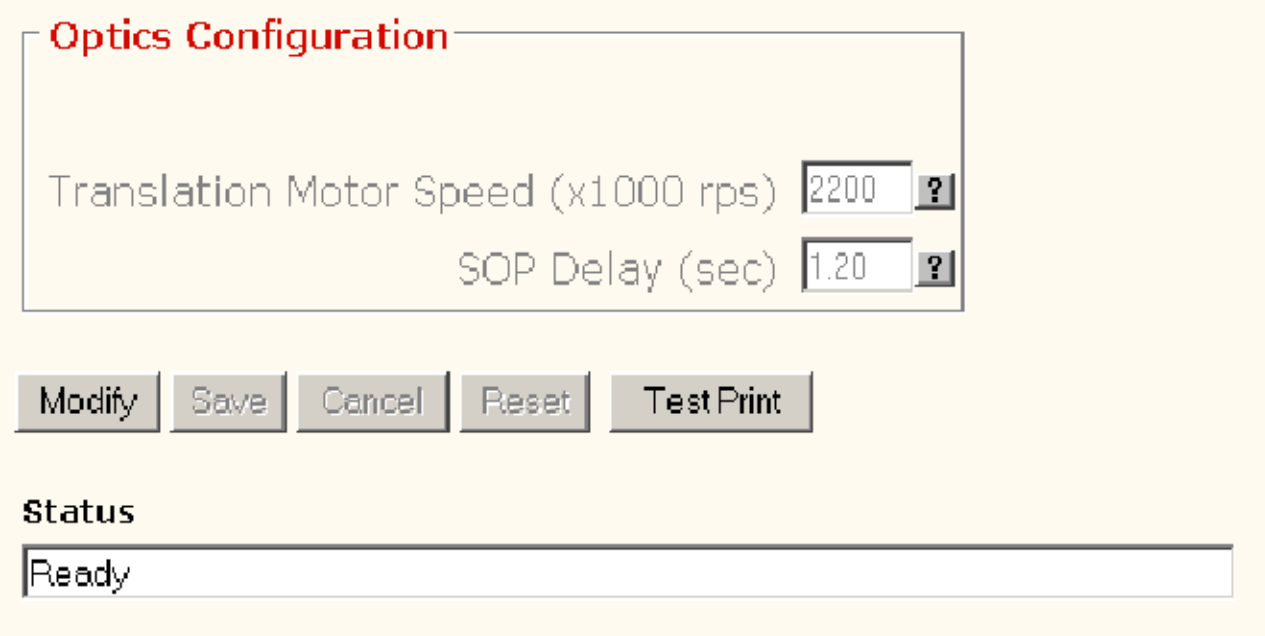
- Image height should measure 334.8 mm for 14x14–inch film or 346.7 mm for 14x17–inch film.
- Left and right margins on the page must be equal, approximately 4 mm each.
- No clear margins should show on the sides of the film.

Special Tools

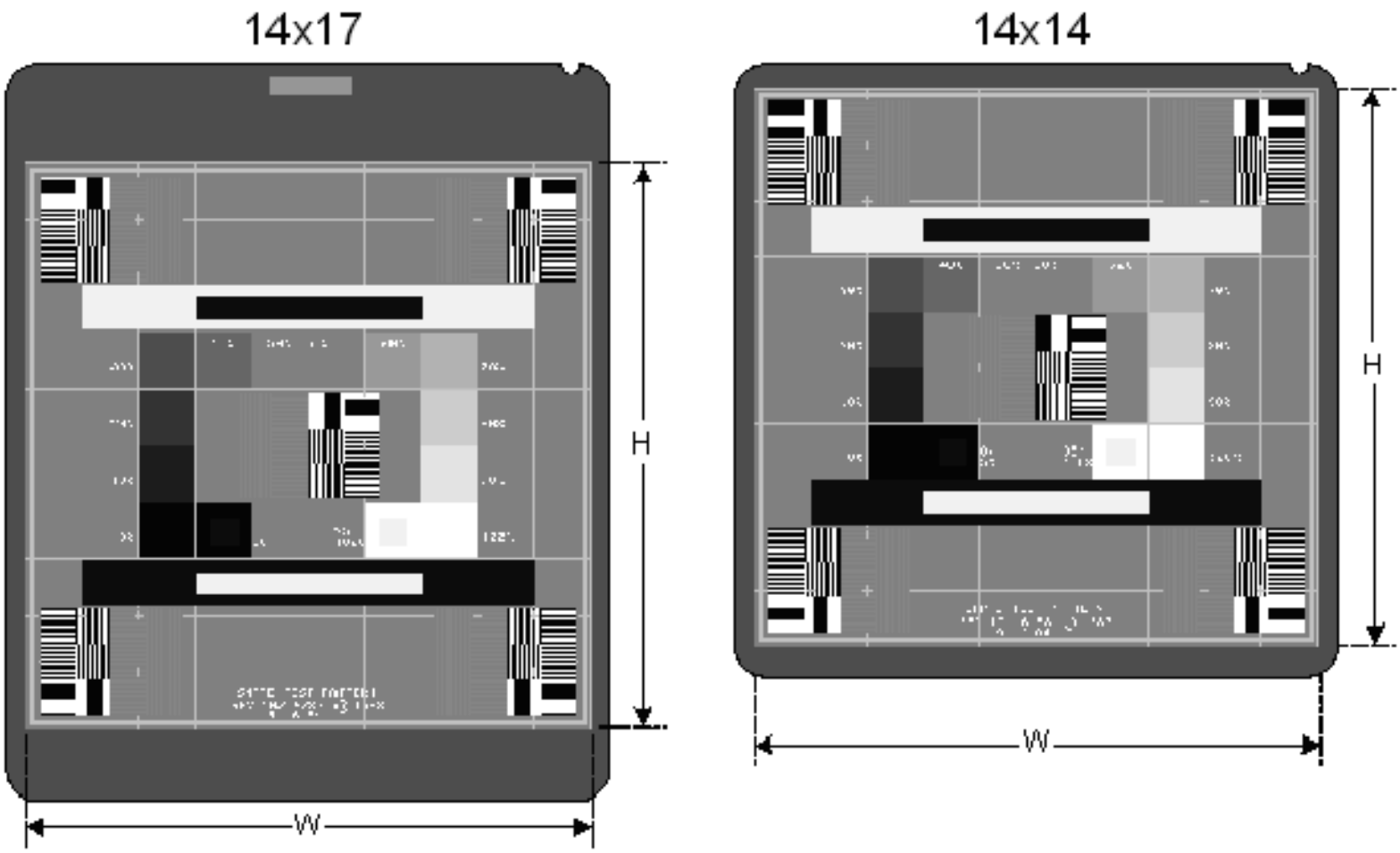
LAPTOP COMPUTER with *Microsoft* INTERNET EXPLORER 5.5
SERVICE TOOL
Ethernet PATCH CABLE
Metric ruler with millimeter units

Measurement

1. Load a cartridge of film in the IMAGER. Use 14x14 or 14x17–inch film.
2. Use a PATCH CABLE to connect your LAPTOP COMPUTER to the Service Port under the HOOD.
3. Energize the LAPTOP COMPUTER.
4. Connect to the SERVICE TOOL through SecureLink.
5. Access the SERVICE TOOL main menu through the WebLink.
6. Select **Configuration>MCS>Optics**.



7. Click [Test Print] to run a test print for examination. Select test image SMPTE1K and Contrast = 1.



8. Measure the height of the image. It should measure 334.8 mm for 14x14–inch film or 346.7 mm for 14x17–inch film.
9. Measure the width of the image.

   The width should be equal to the height. If it is not, adjust the Transport Motor Speed until width = height. 7.5 counts (approximately) = 1 mm. Increasing the speed will make the image wider. Decreasing the speed will make the image narrower.
10. When width and height are equal, measure the left and right borders and determine how far the image must be shifted to center the Image on the film.
11. Adjust the SOP Delay to make the right and left borders equal (approximately 4 mm). Changing the SOP Delay ± 0.1 second shifts the image 1mm left or right on the film.

Note

There is no height adjustment for the image that can be done in the field.

3-5. Reference Level for DENSITOMETER

If the DENSITOMETER BOARD or the LIGHT SOURCE BOARD is replaced, the light source reference level must be checked and adjusted.

Specification

Reference level must be within the range shown on the **Densitometer Configuration** graph in the SERVICE TOOL.
Target values are:

- Offset: 4096
- Reference: 197888 – 214272

Special Tools

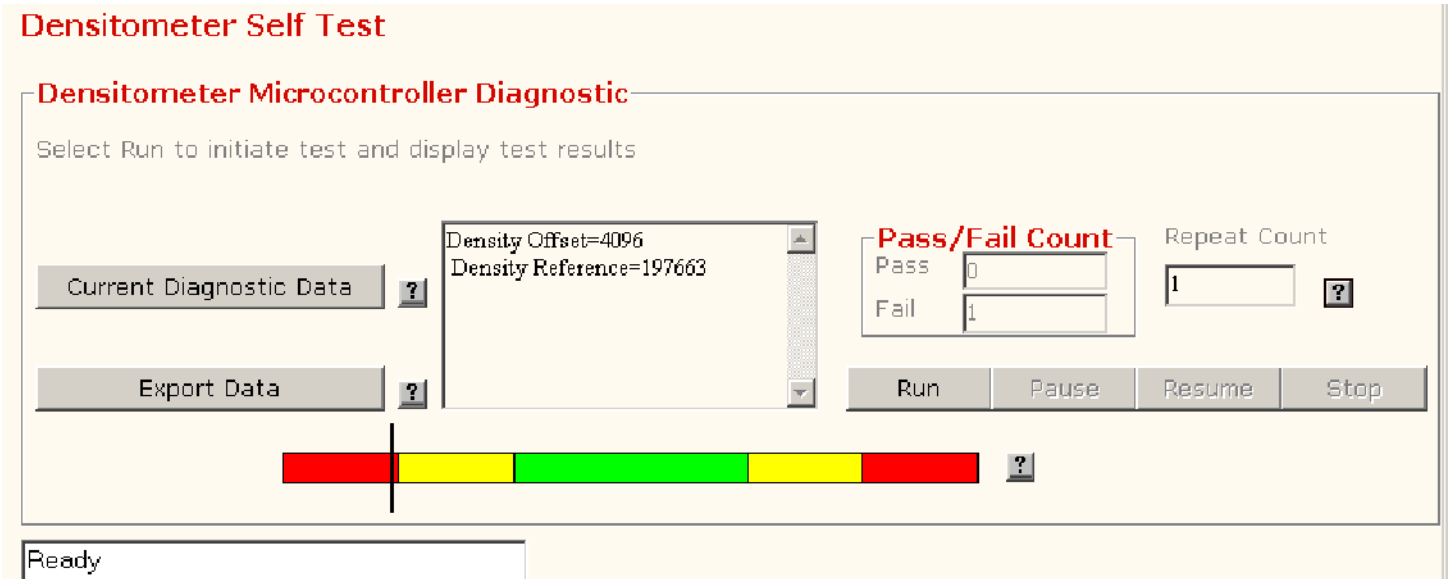
LAPTOP COMPUTER with Internet Explorer 5.5 or higher
SERVICE TOOL
Ethernet PATCH CABLE
POT ADJUSTMENT TOOL

Preliminary

Note

The following procedure should be performed in subdued lighting. Make the area as dark as possible. Also, do not attempt the procedure while the IMAGER is in a print cycle.

1. Use a straight–through PATCH CABLE to connect your LAPTOP COMPUTER to the IMAGER Service Port.
2. Energize the IMAGER.
3. Use SecureLink to connect to the IMAGER.
4. Use WebLink to display the main menu of the SERVICE TOOL.
5. Select **Diagnostics>MCS>Densitometer**.



6. Click [Run] to start the test of the DENSITOMETER.

7. Check that:
   - The vertical reference bar on the colored gauge is within the yellow or green area.
   - The Density Offset and Reference values are within Specification.

Adjustment

1. Lift the UPPER HOOD.
2. Remove four SCREWS attaching the DENSITOMETER MODULE and slide the MODULE out about 3 inches to access the LIGHT SOURCE BOARD (see Figure 3-5).

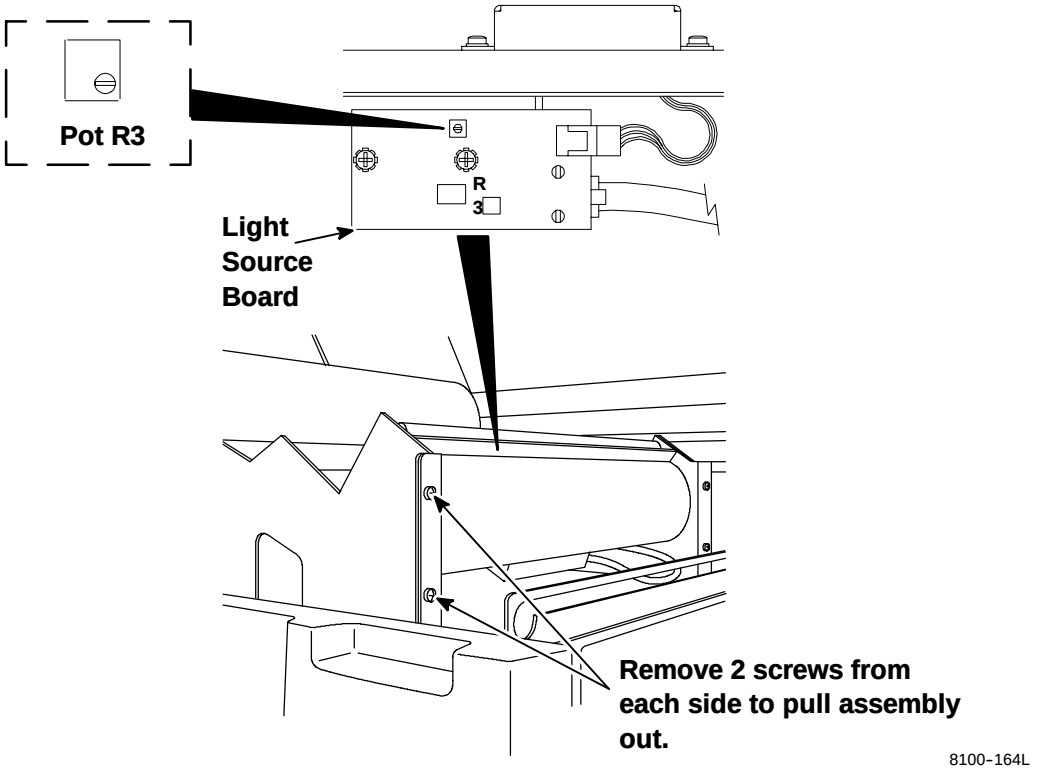


Figure 3-5. Adjusting Reference Level for the DENSITOMETER

3. Change Repeat Count to 0 (zero).
4. Adjust POT R3 on the LIGHT SOURCE BOARD fully CCW (see figure 3-5) until it clicks.

Caution

In the following procedure DO NOT allow the reference bar to move **past the center of the gauge**. Also, it is critical that the reference bar **never moves from right to left**. If it does, the A/D CONVERTER is overdriven and will produce negative readings from a cal film, resulting in a failed calibration.

5. While observing the reference level gauge on the screen, slowly adjust R3 CW so the reference bar begins to move toward the center of the gauge. (It will require several turns of the POT.)

Note

It will take up to a minute for the reference bar to complete moving in the adjustment.

6. Center the reference level bar in the green and yellow areas on the gauge.

7. Close the UPPER HOOD and verify that the reading does not change significantly.
8. Open the HOOD and reattach the DENSITOMETER MODULE to the FRAME (4 SCREWS).
9. Return the Repeat Count to 1 (one).
10. Close the “Densitometer Self-Test” screen.

Caution

If the Densitometer Configuration Screen is active any time during calibration or normal printing, Dpatch timeouts or calibration errors will occur, resulting in calibrations and job reprints.

3-6. Dynamic Range of the LASER

Dynamic range of the LASER is automatically tested at power up and whenever a test calibration occurs. It is defined as the ratio of maximum laser power minus power monitor offset to minimum laser power minus power monitor offset (Max power – Offset)/ (Min power – Offset). Power monitor offset is the power monitor output value measured when the LASER is turned off. A laser dynamic range failure can be caused by a bad power monitor offset value.

Caution

Do not perform this procedure unless you are sure it is required. It should be performed only when an MCS BOARD or the SCANNER ASSEMBLY has been replaced, or error 27-604 has occurred. Unnecessary adjustment can degrade image quality.

Note

This procedure cannot be run while the IMAGER is in Service mode. (With the IMAGER in Service mode, the laser dynamic range is 1.) If the IMAGER has been in Service mode, set the SERVICE SWITCH to User mode and cycle power before performing the procedure. Also, the UPPER HOOD, FRONT DOOR and REAR PANEL must be closed for the adjustment to work.

Specification

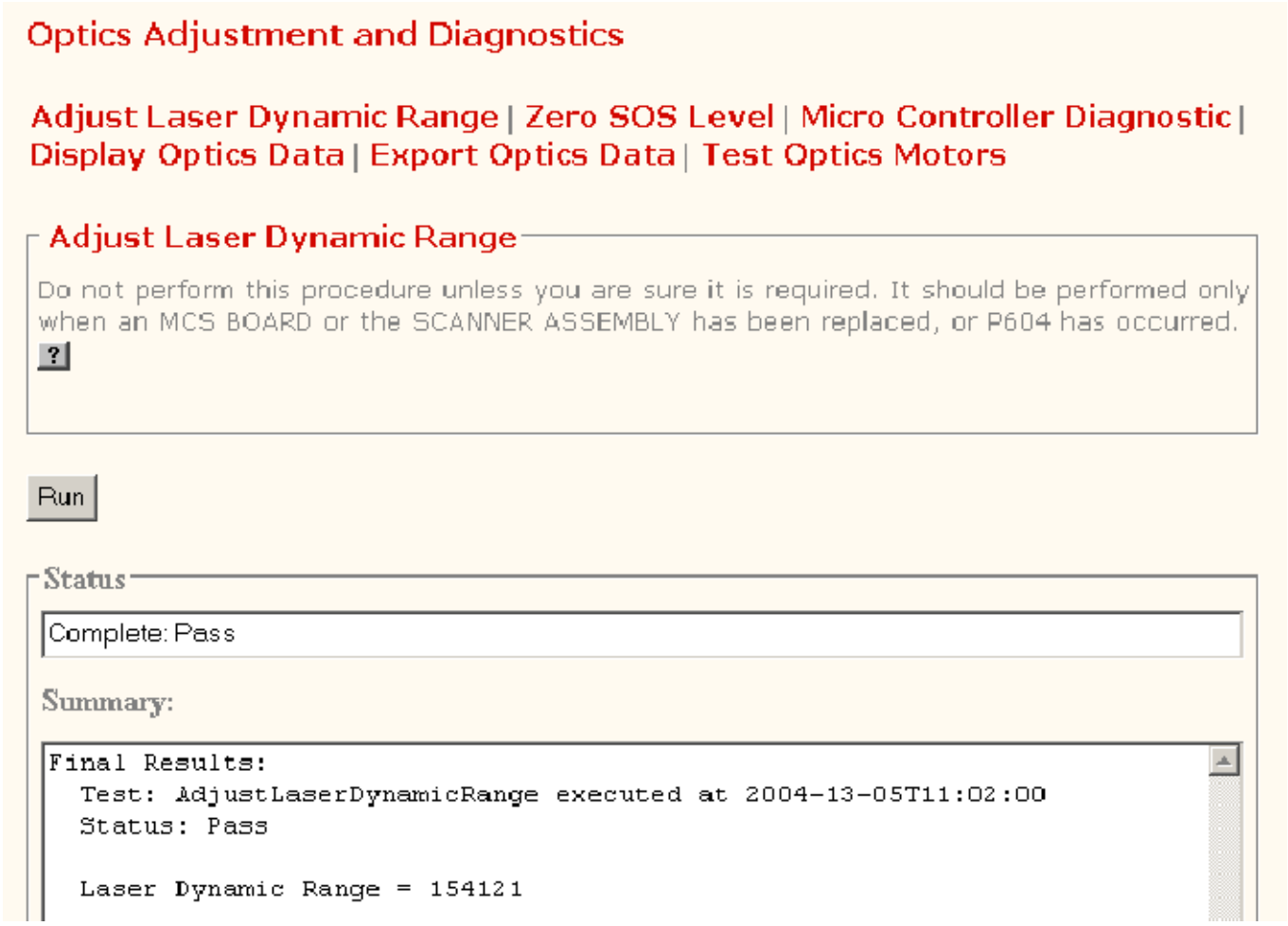
Laser dynamic range is 100 to 200. Desired value is 150. Values between 140 and 160 are acceptable.

Required Tools

LAPTOP COMPUTER with Internet Explorer 5.5 or higher
SERVICE TOOL
Ethernet PATCH CABLE

Check and Measurement

1. Use a PATCH CABLE to connect your LAPTOP COMPUTER to the IMAGER Service Port.
2. Energize the IMAGER.
3. Use SecureLink to connect to the IMAGER.
4. Use WebLink to display the main menu of the SERVICE TOOL.
5. Select **Diagnostics>MCS>Optics>Adjust Laser Dynamic Range**.
6. Click [Run]. The SERVICE TOOL will perform an adjustment automatically.


Optics Adjustment and Diagnostics
Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Adjust Laser Dynamic Range
Do not perform this procedure unless you are sure it is required. It should be performed only when an MCS BOARD or the SCANNER ASSEMBLY has been replaced, or P604 has occurred.
?
Run
Status
Complete: Pass
Summary:
Final Results:
Test: AdjustLaserDynamicRange executed at 2004-13-05T11:02:00
Status: Pass
Laser Dynamic Range = 154121

7. Check that “Status” is Pass and that the laser dynamic range is between 140 and 160.

Note

In some cases you will have to repeat the adjustment several times. As you do, note whether the measured values are improving.

8. After the adjustment is completed, run a calibration print before running any other print.

Caution

If a print is initiated before calibration, 27-622 (Media LUT Non-Monotonic) will occur.

3-7. OPTICS LASER POWER

Do this procedure only if 27-602 errors occur, indicating invalid POWER MONITOR range.

Specification

TP2 on the MCS BOARD must indicate +2 volts dc.

Special Tools

LAPTOP COMPUTER with Internet Explorer 5.5 or higher
SERVICE TOOL
Ethernet PATCH CABLE
DIGITAL VOLTMETER
POT ADJUSTMENT TOOL

Measurement

1. De-energize the IMAGER.
2. Remove the REAR PANEL and defeat the REAR PANEL INTERLOCK.
3. Energize the IMAGER and wait for error 27-602 to occur.
4. Set the DIGITAL VOLTMETER to read DC Volts.
5. On the MCS BOARD, connect the positive lead of the DIGITAL VOLTMETER to TP2 and the negative lead to AGND1.

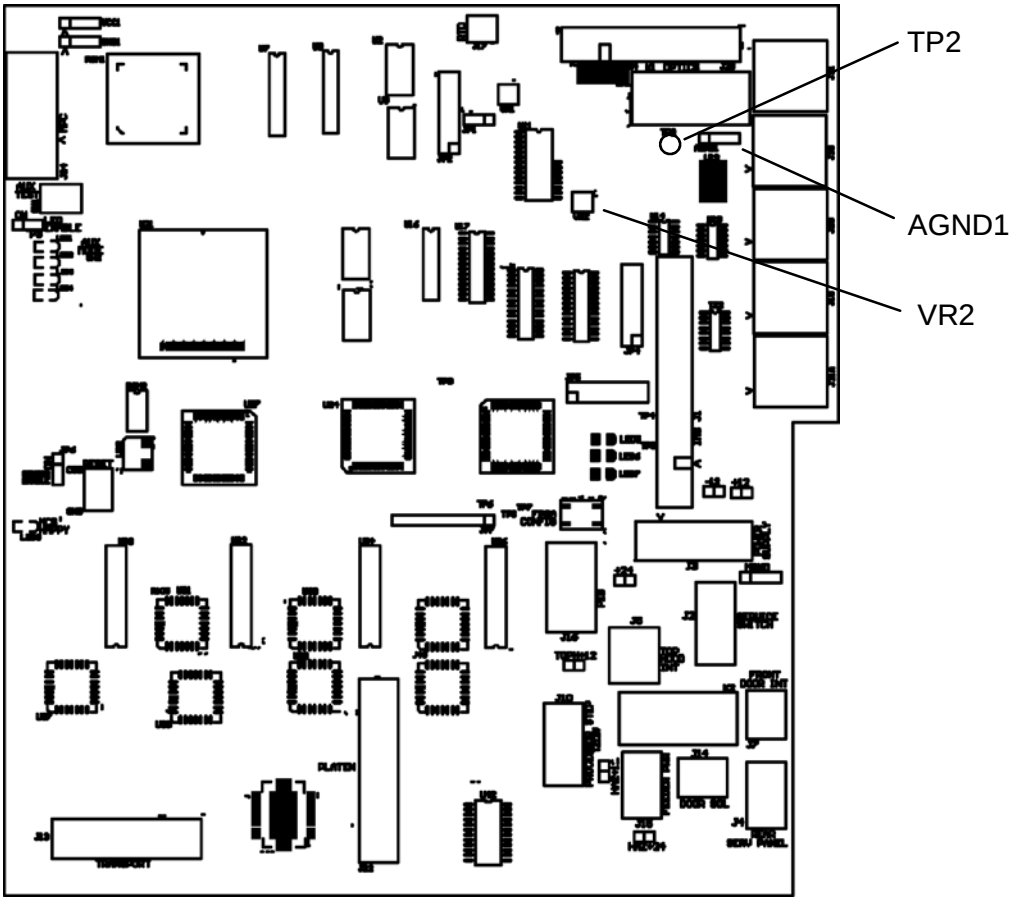
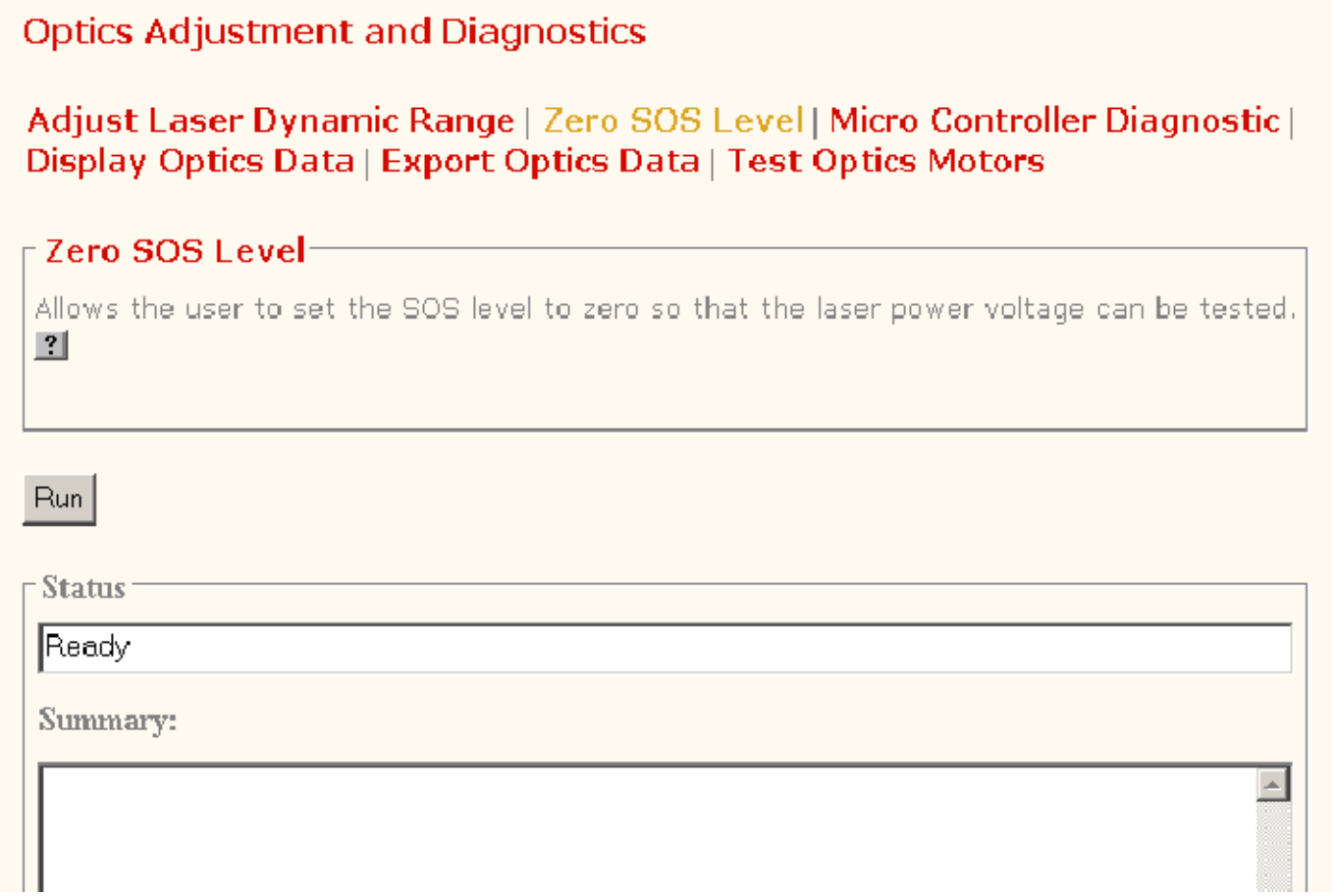


Figure 3-6. Optics Laser Adjustment on MCS BOARD

6. Use a PATCH CABLE to connect your LAPTOP COMPUTER to the IMAGER Service Port.
7. Energize the IMAGER.
8. Use SecureLink to connect to the IMAGER.
9. Use WebLink to display the main menu of the SERVICE TOOL.
10. Select **Diagnostics>MCS>Optics>Zero SOS Level**.


Optics Adjustment and Diagnostics
Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Zero SOS Level
Allows the user to set the SOS level to zero so that the laser power voltage can be tested.
?
Run
Status
Ready
Summary:

11. Click [Run] to set the SOS Level to zero.
12. Check the DIGITAL VOLTMETER, It should indicate 2.0 volts dc. If it does not, do the following adjustment.

Adjustment

1. Adjust VR2 (OPTICS) on the MCS BOARD so the DIGITAL VOLTMETER indicates 2.0 volts dc.
2. De-energize the IMAGER. Then energize the IMAGER and check whether error 27-602 occurs.
   - If 27-602 does not occur, do a calibration.
   - If 27-602 occurs, see the QuickSheet for 27-602 in Section 8.

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Section 4 – Disassembly/Reassembly

4-1. FRONT DOOR and REAR PANEL ASSEMBLIES

4-1-1. FRONT DOOR FILTER

For the procedure to remove and replace the FRONT DOOR FILTER and align the FRONT DOOR, refer to procedure 5-4-6 in section 5 of this manual.

4-1-2. REAR PANEL

1. On the LOCAL PANEL press **FILM Supply**> **Open Door** to close the FILM CARTRIDGE.
2. Remove 9 ATTACHING SCREWS from the REAR PANEL (Figure 4-1).

Warning

When the REAR PANEL is removed, all MOTORS and the LASER are disabled. However, power remains applied to the IMAGER. If you need to activate the MOTORS, actuate the SERVICE SWITCH. Be aware that hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

3. Pull the top of the REAR PANEL BACK, and lift up to remove the PANEL FEET from the SLOTS in the MACHINE BASE.
4. Set the REAR PANEL aside.

Note

During reassembly ensure that the INTERLOCK on the REAR COVER is engaged before tightening the SCREWS.

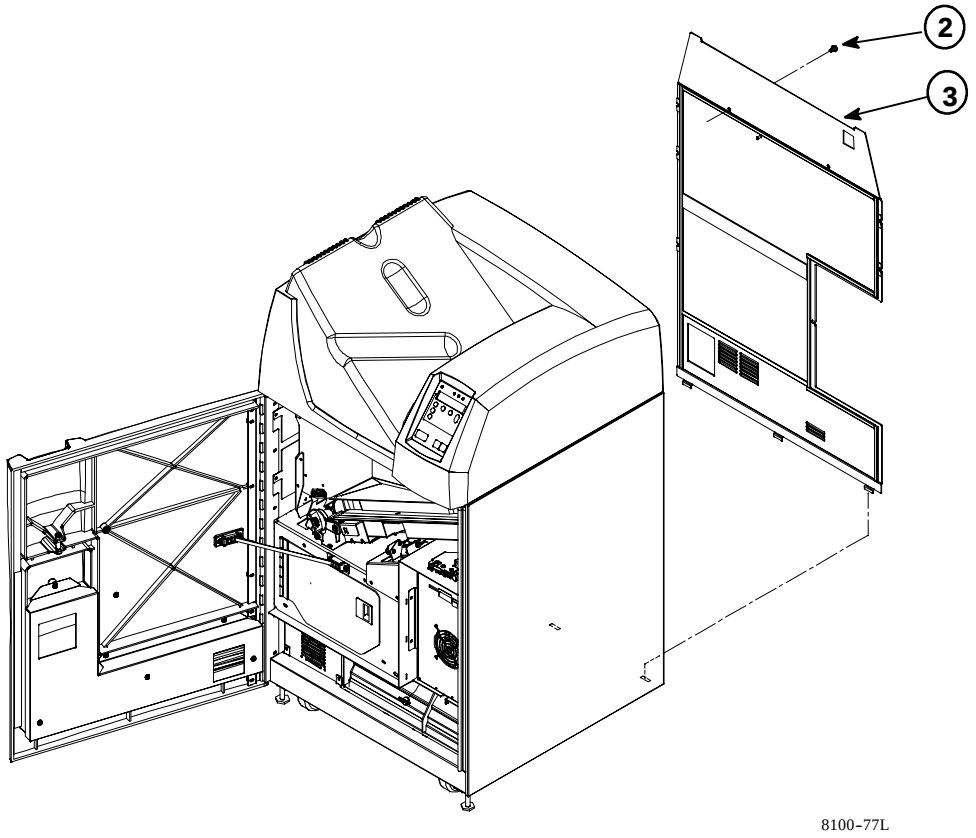


Figure 4-1. Removing the REAR PANEL

4-2. FILM PROCESSOR ASSEMBLY

Caution

Any CIRCUIT BOARD that is replaced in the IMAGER must be returned to Kodak for rework or disposed of properly. CIRCUIT BOARDS contain lead.

4-2-1. PROCESSOR INTERFACE BOARD

1. On the LOCAL PANEL press **FILM Supply**> **Open Door** to close the FILM CARTRIDGE.
2. De–energize the IMAGER and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

3. Open the UPPER HOOD and remove the REAR PANEL.
4. Disconnect the DRUM CABLE. (Figure 4-2).
5. Remove 4 ATTACHING SCREWS from the COVER BOX.
6. Lift the COVER BOX free from the PROCESSOR INTERFACE BOARD.

Note

The cover is difficult to remove.

7. Remove 4 ATTACHING SCREWS from the corners of the BOARD, and remove the BOARD.

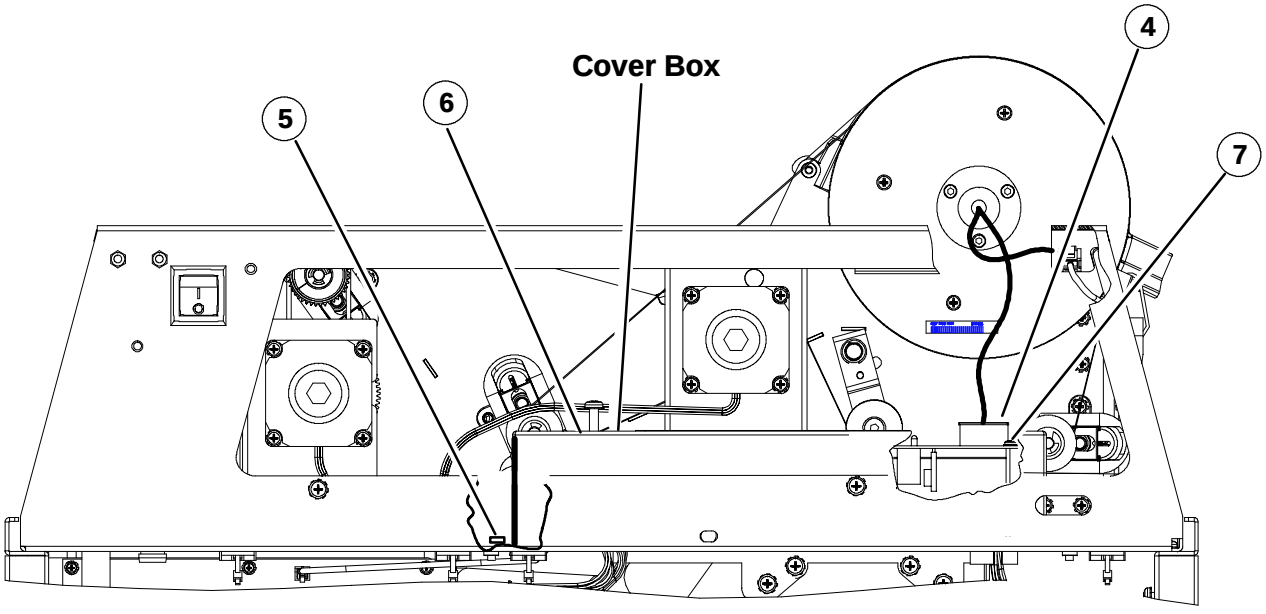


Figure 4-2. Removing the PROCESSOR INTERFACE BOARD

4-2-2. PROCESSOR DRUM

Disassembly

1. De−energize the IMAGER and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD.
3. Remove the REAR PANEL.
4. Disconnect the 2 CABLES extending from the DRUM (See View A in Figure 4-3).
5. Lift the BELT TENSIONER (View A) to provide slack in the BELT, and remove the BELT from the DRUM PULLEY.

Caution

Hot Surface

When the IMAGER is initially de−energized, the PROCESSOR DRUM and ROLLERS are hot. Take care when removing the DRUM.

6. Release the clamps (View B) from the cover of the processor and open the processor cover.

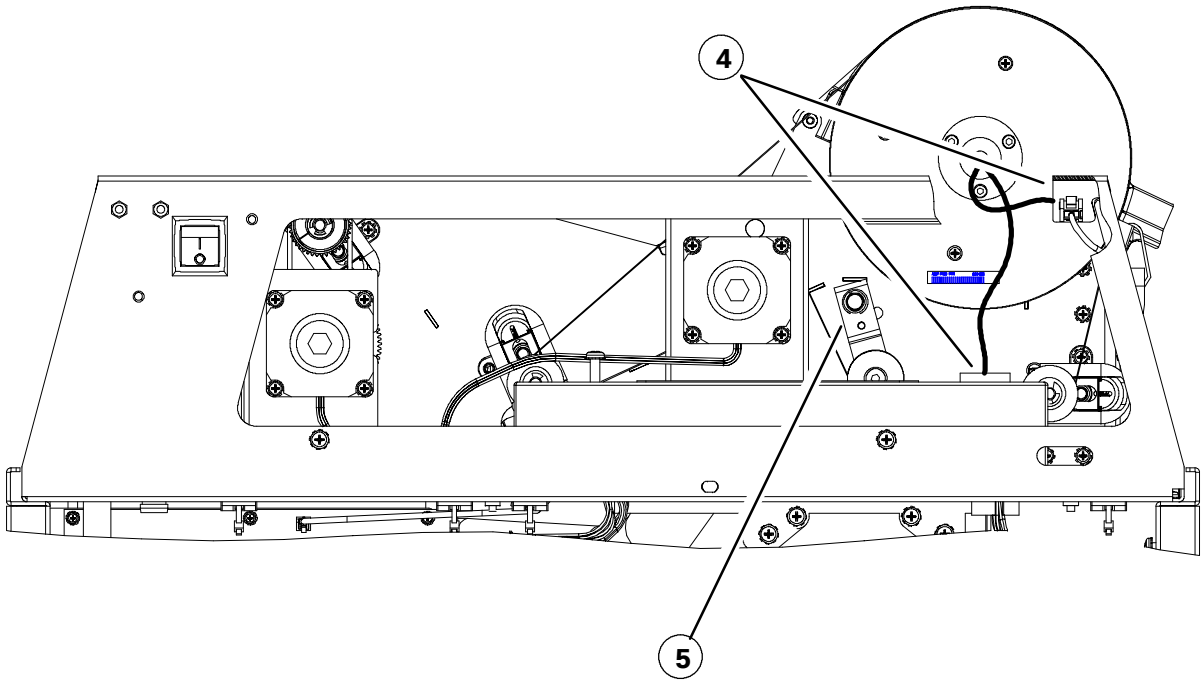
Caution

The surface of the DRUM is easily damaged by fingernails and jewelry. Handle the DRUM with 1 hand on the large PULLEY and the other hand on the opposite ENDCAP. Do not touch the silicone surface of the DRUM.

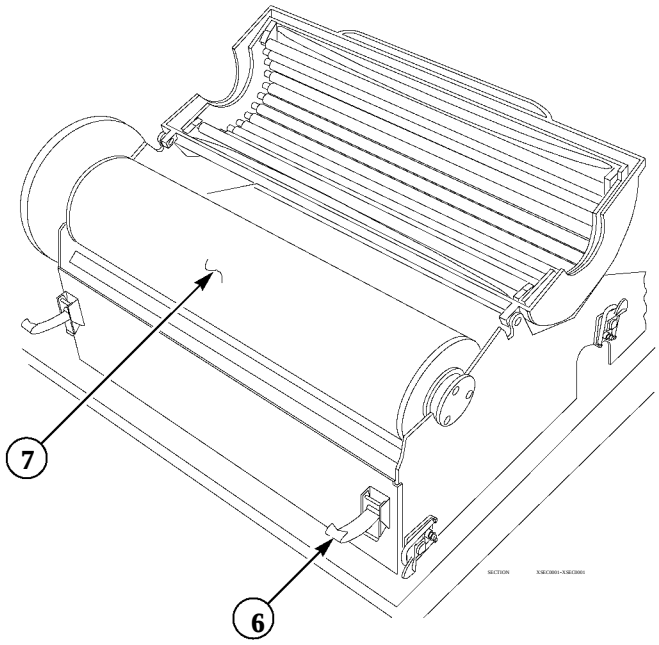
7. Lift the DRUM from the PROCESSOR and lay it on a flat, stable surface. (The PULLEY will prevent the silicone surface of the DRUM from touching the flat surface.) As an option, you can place the DRUM in the CRADLE made by the PROCESSOR COVER ASSEMBLY.

Note

Whenever a new DRUM is installed, the temperature adjustment for the PROCESSOR must be performed (procedure 3-1 in Adjustments).



View A. Rear



View B. Front

8100-70A

Figure 4-3. Removing the Processor Drum

4-2-3. PROCESSOR ROLLERS and Related Parts

Disassembly

1. Remove power and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD and allow the PROCESSOR to cool before proceeding.

Caution

Hot Surface

When the IMAGER is initially powered down, the PROCESSOR DRUM and ROLLERS are hot. Take care when removing the ROLLERS.

3. Release the 2 CLAMPS and open the PROCESSOR COVER.
4. To remove the ROLLERS, simply lift each ROLLER from the RETAINER CLIPS at each end (Figure 4-4).

Note

The BEARINGS on the ends of each ROLLER are loose. Take care not to lose the BEARINGS or the SPRINGS that they mount on in the RETAINER CLIPS.

Reassembly

1. Install a BEARING on each end of the ROLLER, and make sure each RETAINER CLIP includes a SPRING.
2. Insert the BEARINGS (with ROLLER) into the RETAINER CLIPS as shown in the inset in Figure 4-4. Check that: (a) each ROLLER rotates freely, (b) each BEARING is free to slide against the SPRING in the RETAINER, and (c) the SPRINGS are not bent.

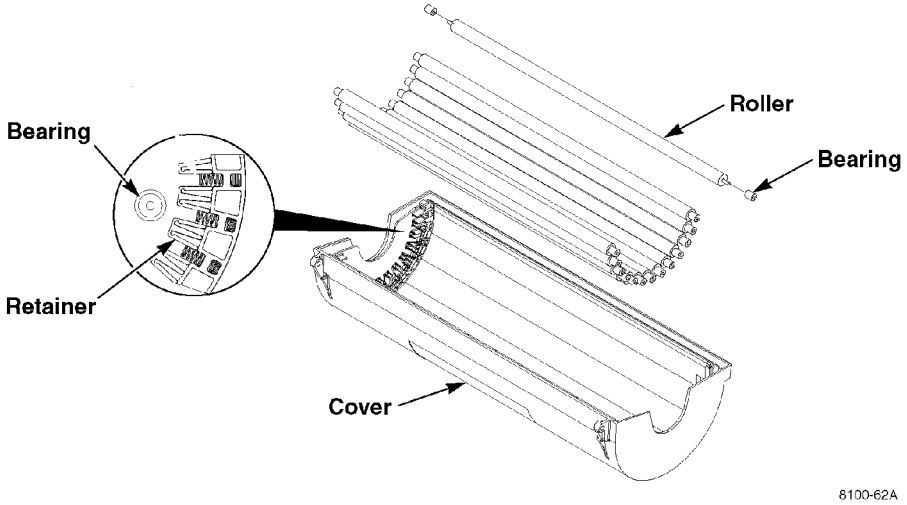


Figure 4-4. Removing the PROCESSOR ROLLERS

4-2-4. Processor Motor

1. Open the FRONT DOOR to close the FILM CARTRIDGE. Then remove power and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD and remove the REAR PANEL.
3. Lift the BELT TENSIONER (Figure 4-5) to provide slack in the BELT, and remove the BELT from the MOTOR PULLEY.
4. Remove 4 SCREWS and remove the PROCESSOR MOTOR from the BRACKET.
5. Remove 4 SCREWS and remove the COVER.

Note

The cover is difficult to remove.

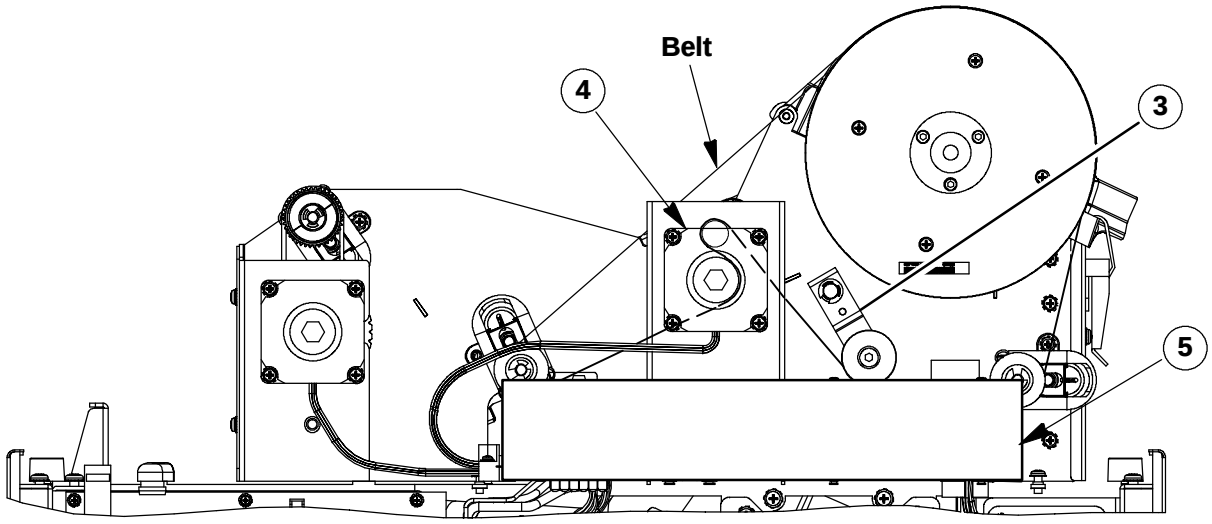


Figure 4-5. Removing the PROCESSOR MOTOR

Continue on next page.

6. Remove the STRAIN RELIEF BLOCK (2 SCREWS).
7. Cut the CABLE TIE.
8. Remove the spiral CABLE WRAP around the cable harness (not shown).
9. Follow the MOTOR CABLE down to the MCS BOARD.
10. Remove the MOTOR PLUG from CONNECTOR J10 on the MCS BOARD.
11. Remove MOTOR and CABLE.

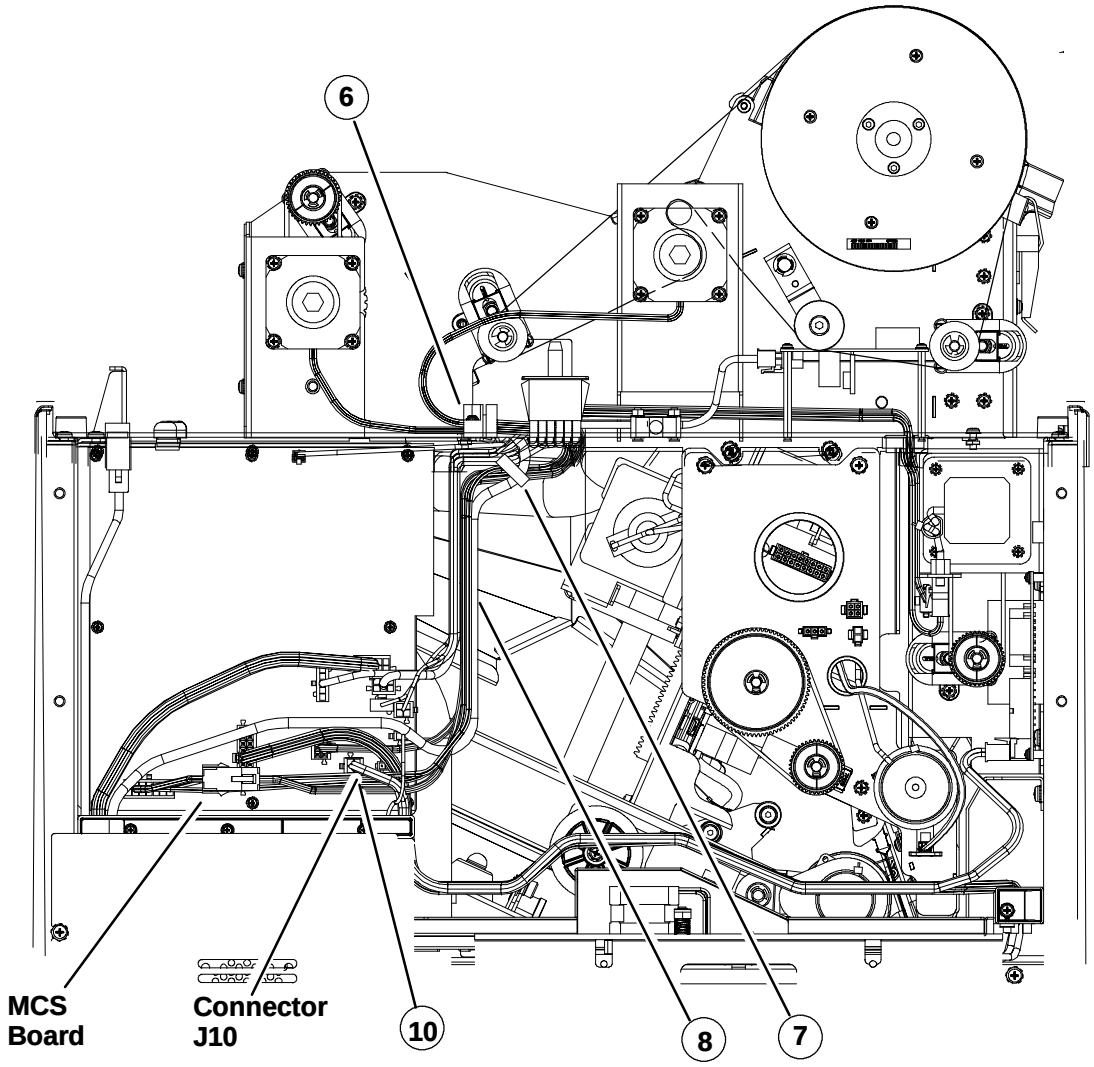


Figure 4-6. Removing the PROCESSOR MOTOR

4-2-5. Kicker Motor

1. Open the FRONT DOOR to close the FILM CARTRIDGE. Then remove power and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD and remove the REAR PANEL.
3. Remove 4 SCREWS and remove the KICKER MOTOR from the BRACKET.
4. Remove 4 SCREWS and remove the COVER.

Note

The cover is difficult to remove.

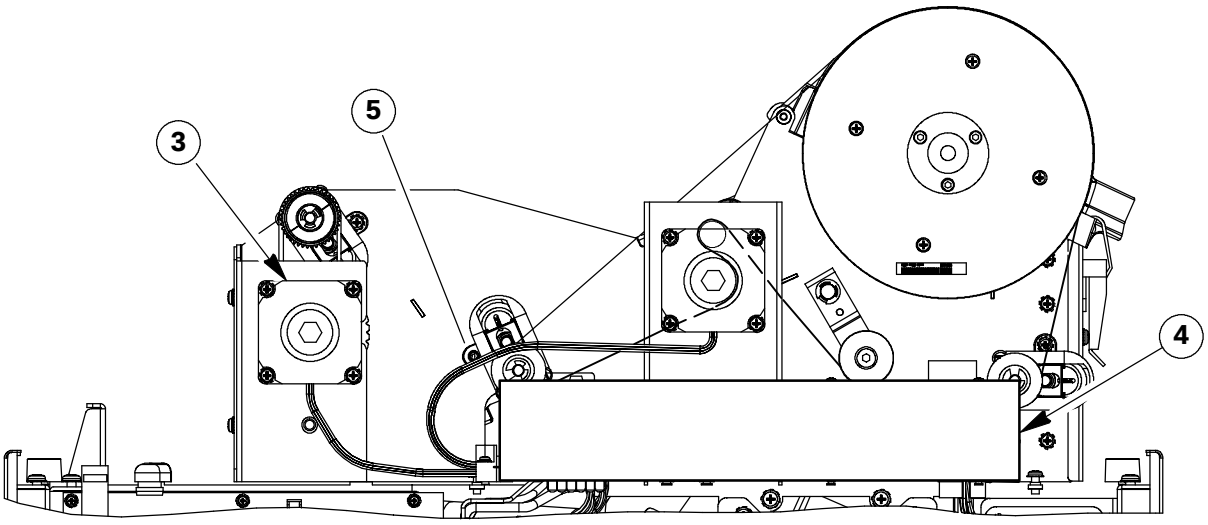


Figure 4-7. Removing the KICKER MOTOR

Continue on next page.

5. Remove the STRAIN RELIEF BLOCK (2 SCREWS).
6. Cut the CABLE TIE.
7. Remove the spiral CABLE WRAP around the cable harness (not shown).
8. Follow the MOTOR CABLE down to the IN–LINE CONNECTOR.
9. Disconnect the IN–LINE CONNECTOR.
10. Remove MOTOR and CABLE.

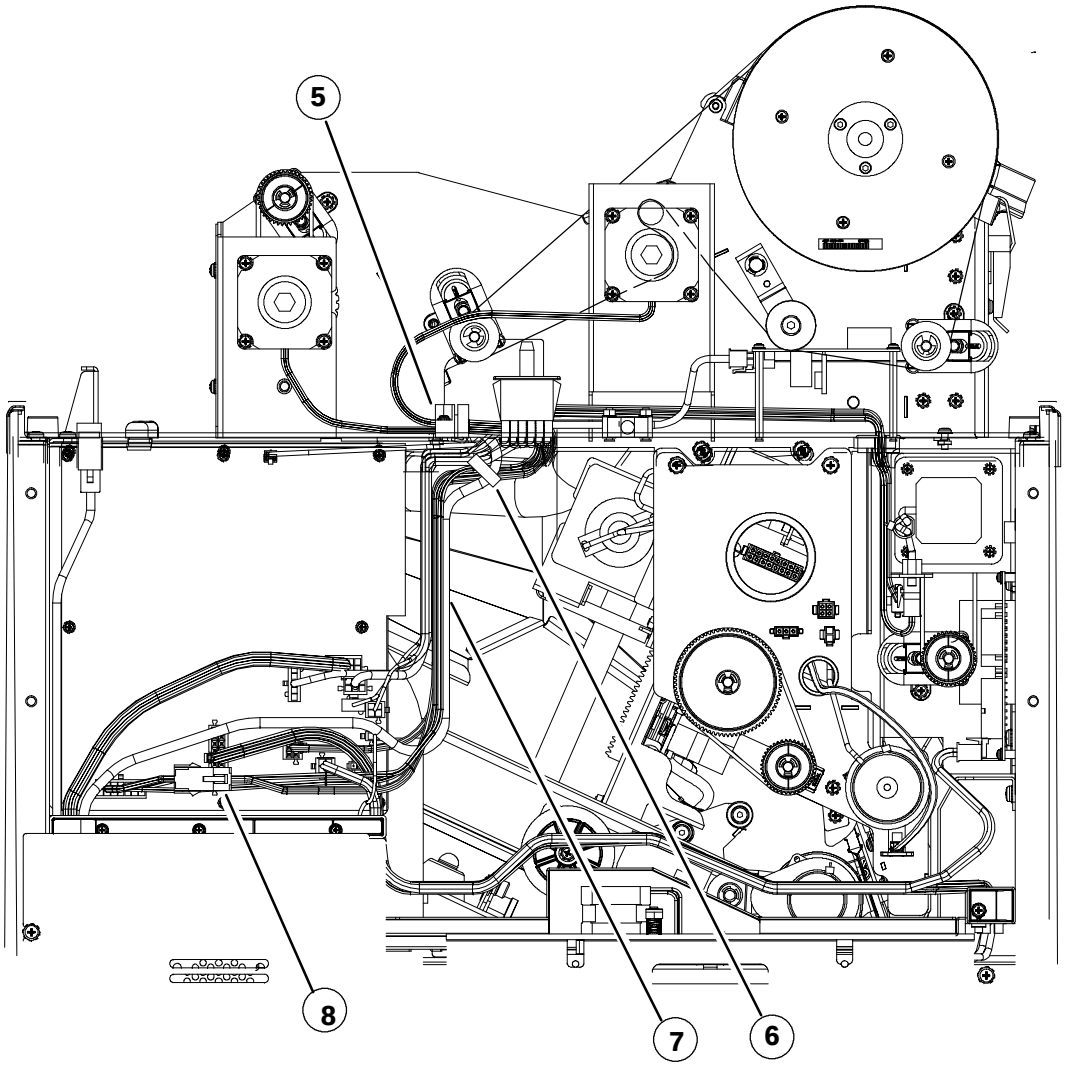


Figure 4-8. Removing the KICKER MOTOR

4-2-6. PROCESSOR FILM DIVERTER ASSEMBLY

1. De-energize the IMAGER and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD.

Caution

Hot Surface

When the IMAGER is initially de-energized, the PROCESSOR DRUM and ROLLERS are hot. Take care when working in the area of the PROCESSOR.

3. Lift up the HEAT SHIELD (Figure 4-9).
4. Remove 2 SCREWS and remove the FILM DIVERTER ASSEMBLY (including stripper and FELT PAD).

Note

When you replace a FILM DIVERTER ASSEMBLY, see the adjustment procedure, paragraph 3-3 in Section 3.

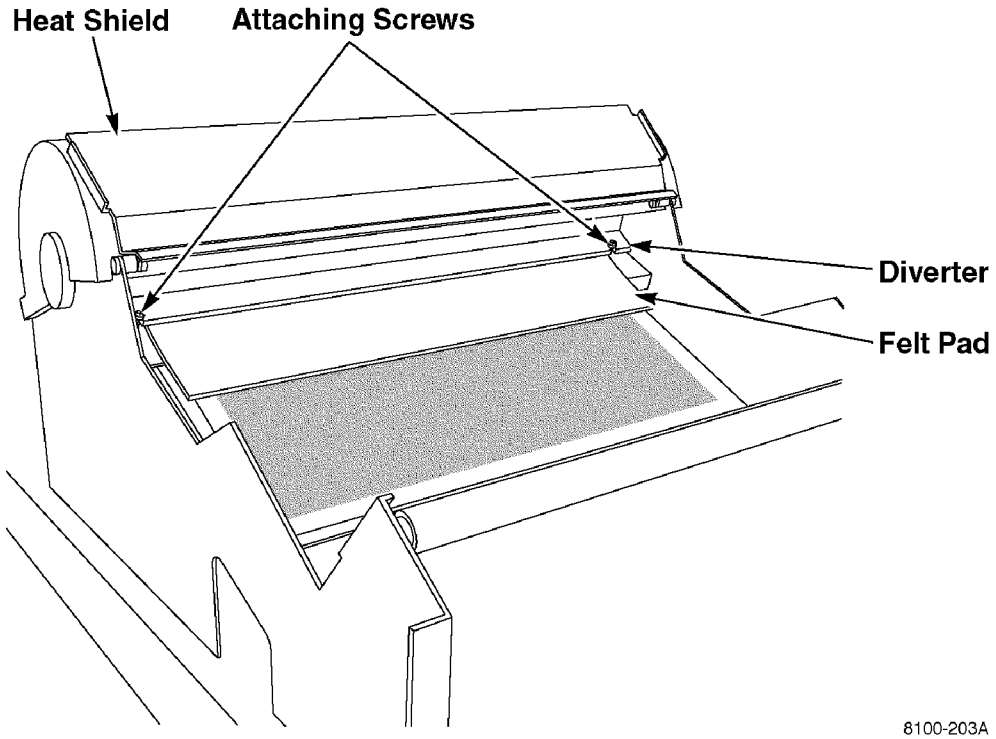


Figure 4-9. Removing the PROCESSOR DIVERTER and FELT PAD

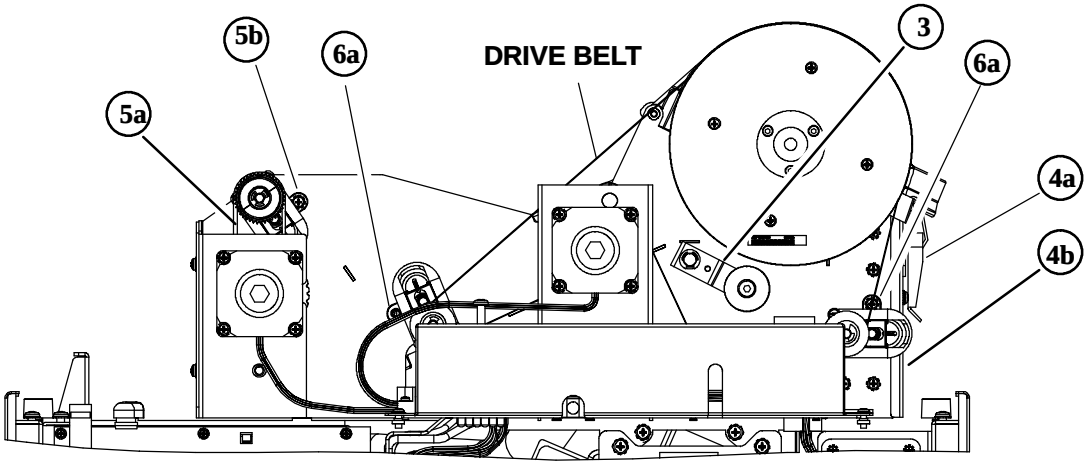
4-3. ROLLER SET ASSEMBLIES

1. Open the FRONT DOOR to close the FILM CARTRIDGE. Then remove power and disconnect the POWER CORD.

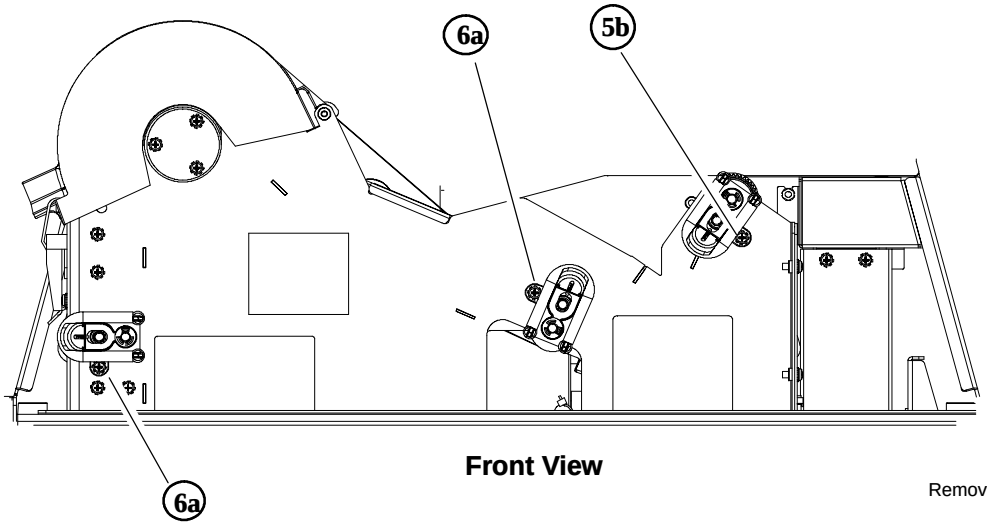
Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD and remove the REAR PANEL (paragraph 4-1-2).
3. Lift the BELT TENSIONER and remove the TRANSPORT/PROCESSOR DRIVE BELT (Rear View in Figure 4-10).
4. For the TRANSPORT ROLLER ASSEMBLY located at the REAR BASE of the PROCESSOR only:
   a. Open the 2 LATCHES and remove 2 SCREWS under the LATCHES.
   b. Remove the BACK LATCH PLATE (Rear View)
5. For EXIT ROLLER SET ASSEMBLY:
   a. Remove the EXIT BELT.
   b. Remove 1 ATTACHING SCREW from each end of the ASSEMBLY (Rear View and Front View).
   c. Pull the ROLLER ASSEMBLY out of its SLOT (Front View).
6. For the other 2 ROLLER SET ASSEMBLIES:
   a. Remove 1 ATTACHING SCREW from each end of the ASSEMBLY (Rear View and Front View).
   b. Pull the ROLLER ASSEMBLY out of its SLOT (Front View).



Rear View



Front View

RemoveTransRollers

Figure 4-10. Removing the TRANSPORT ROLLER SET ASSEMBLIES

4-4. DENSITOMETER ASSEMBLY

4-4-1. DENSITOMETER MODULE

1. De–energize the IMAGER and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD.
3. Remove 4 ATTACHING SCREWS (Figure 4-11).
4. Slide the DENSITOMETER MODULE out far enough to gain access to the RJ45 PLUG on the right side of the DENSITOMETER BOX.
5. Disconnect the RJ45 PLUG from the DENSITOMETER BOX.
6. Remove the MODULE and set it on a work bench.

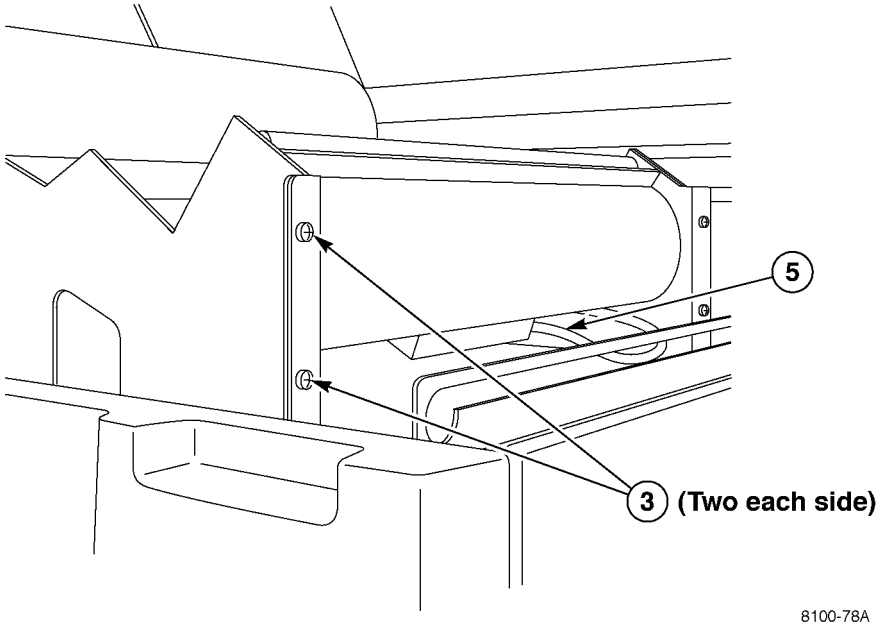


Figure 4-11. Removing the DENSITOMETER MODULE

4-4-2. DENSITOMETER/EXIT SENSOR (S9)

1. Power down and remove the DENSITOMETER MODULE (4-4-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Remove the SCREW on the right side of the SENSOR COVER BOX (Figure 4-12).
3. Loosen the SCREW on the left side of the SENSOR COVER BOX and pivot the COVER BOX over and to the left to expose the SENSOR.
4. Disconnect the PLUG from the SENSOR CONNECTOR.

Caution

If the SENSOR is to be replaced, be very careful not to damage the clips during removal. Also be careful not to damage the fragile ACTUATOR of the SENSOR during disassembly and reassembly.

5. Gently rock the SENSOR back and forth to disengage its CLIPS from the CHASSIS.

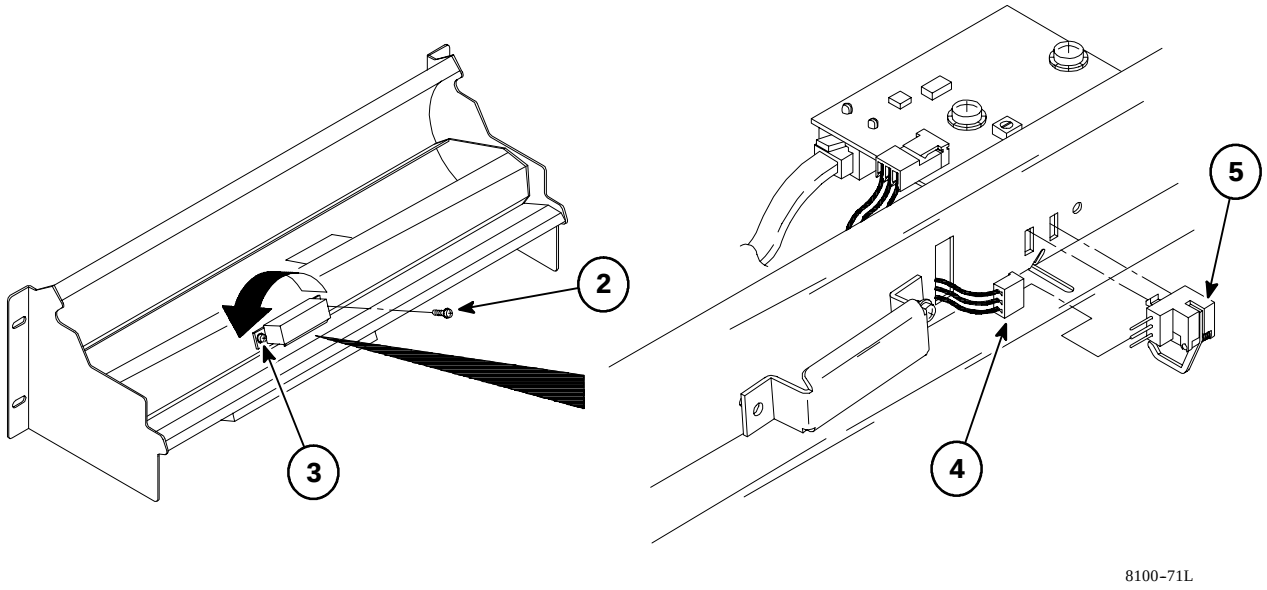


Figure 4-12. Removing the DENSITOMETER/EXIT SENSOR

4-4-3. DENSITOMETER LIGHT SOURCE ASSEMBLY

Caution

Any CIRCUIT BOARD that is replaced in the IMAGER must be returned to Kodak for rework or disposed of properly. PRINTED CIRCUIT BOARDS contain lead.

1. De–energize the IMAGER and remove the DENSITOMETER MODULE (4-4-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Disconnect the 2 ELECTRICAL PLUGS from the BOARD (Figure 4-13).
3. Remove 2 ATTACHING SCREWS and remove the LIGHT SOURCE BOARD.
4. After reassembly and reinstallation of the DENSITOMETER MODULE, adjust the light source reference level as described in paragraph 3-5 in Adjustments.

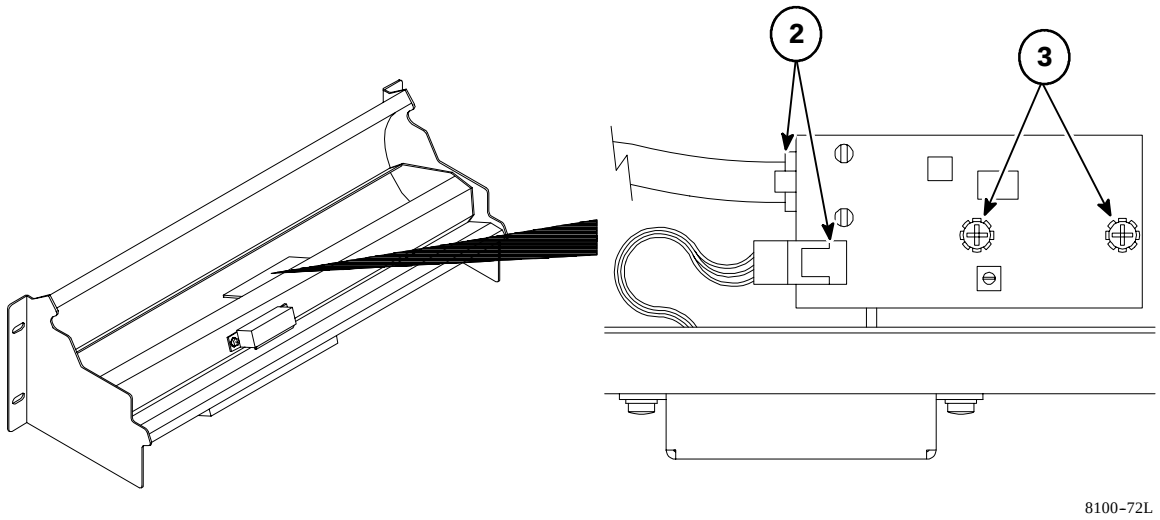


Figure 4-13. Removing the LIGHT SOURCE BOARD

4-4-4. DENSITOMETER BOARD

Caution

Any CIRCUIT BOARD that is replaced in the IMAGER must be returned to Kodak for rework or disposed of properly. PRINTED CIRCUIT BOARDS contain lead.

1. Power down and remove the DENSITOMETER MODULE (4-4-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Remove 4 HEX NUTS and WASHERS and remove the BOX from the DENSITOMETER (Figure 4-14).
3. Disconnect the RJ45 CONNECTOR from the DENSITOMETER.
4. Remove 5 ATTACHING SCREWS and remove the DENSITOMETER BOARD.
5. After reassembly and reinstallation of the DENSITOMETER MODULE, adjust the light source reference level for the DENSITOMETER as described in paragraph 3-5 in Adjustments.

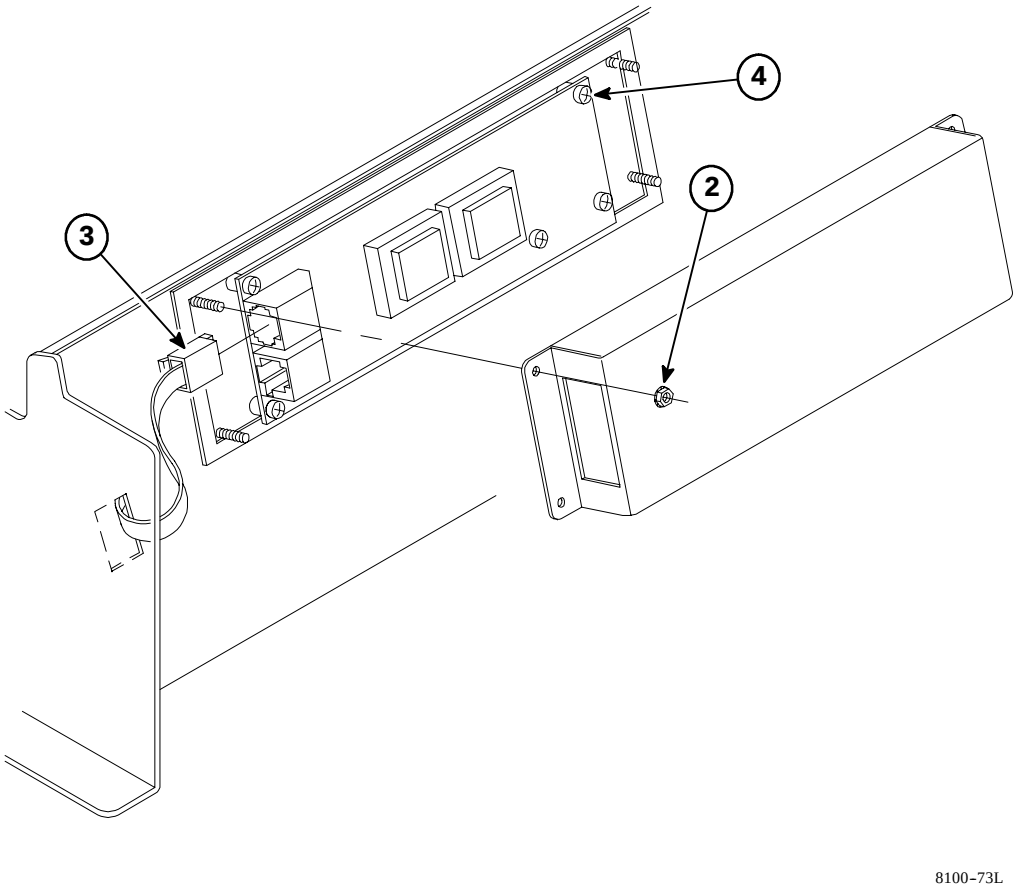


Figure 4-14. Removing the DENSITOMETER

4-5. LOCAL PANEL ASSEMBLY

Caution

Any CIRCUIT BOARD that is replaced in the IMAGER must be returned to Kodak for rework or disposed of properly. PRINTED CIRCUIT BOARDS contain lead.

1. De–energize the IMAGER and disconnect the POWER CORD.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Open the UPPER HOOD.
3. Disconnect CONNECTOR.
4. Remove 4 SCREWS and remove the PANEL (Figure 4-15).

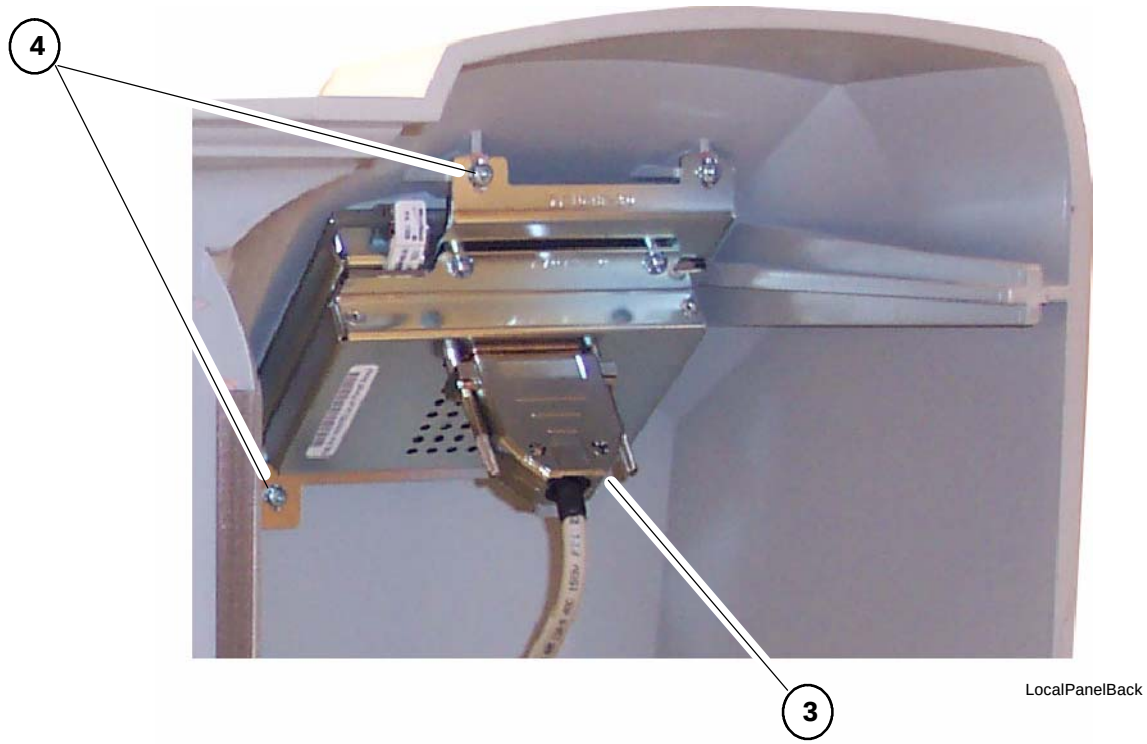


Figure 4-15. Removing the LOCAL PANEL

4-6. FILM PICKUP ASSEMBLY

4-6-1. Film Pickup Module

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize and disconnect the POWER CORD.
3. Open the FRONT DOOR and remove the REAR PANEL.
4. Remove the FEED ROLLER MODULE (see procedure 4-9-1.)
5. Check that the FILM PICKUP CARRIAGE is in the home (retracted) position (SUCKER CUPS are up). If it is not, proceed as follows: While holding the FILM PICKUP CARRIAGE from the bottom to keep it from dropping, pry the release tab out (see Rear View) to disengage the MOTOR DRIVE GEAR. Then lift the CARRIAGE up to the retracted (home) position, and let go of the RELEASE TAB.
6. Remove 2 ATTACHING SCREWS from the front (Front View in Figure 4-16).
7. Disconnect 2 ELECTRICAL CABLES (Rear View in Figure 4-16). (One plugs into the Film Pickup Assembly. The other is the cable to the ROLLBACK MOTOR, which should be disconnected to avoid damage to it.)
8. Remove 2 ATTACHING SCREWS from the back side.
9. The FILM PICKUP ASSEMBLY is hanging by hooks from a ROD. With 1 hand under the heel of the PICKUP MODULE and the other supporting the TOP, carefully lift up to remove the TOP HOOKS from the ROD. Then tip the FILM PICKUP ASSEMBLY slightly to the left and lower it to remove it.

Caution

Be careful in reassembly to avoid damaging WIRES and CONNECTORS.

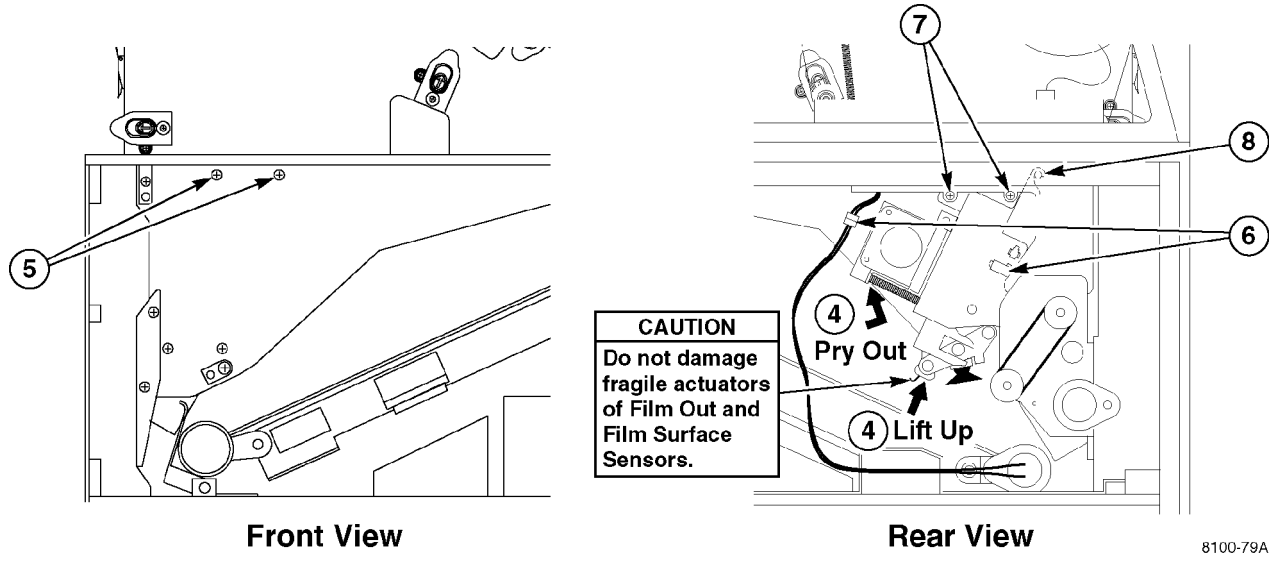


Figure 4-16. Removing the FILM PICKUP ASSEMBLY

4-6-2. FILM PICKUP CUPS

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Remove power and disconnect the POWER CORD.
3. Remove each FILM PICKUP CUP as follows:
   a. Insert a small flat-blade screwdriver into the SLOT at the center of each CUP and turn counterclockwise to remove the CUP and HUB (Figure 4-17).
   b. Use the FLAT BLADE SCREWDRIVER to pry the HUB from the CUP.
4. When reassembling the CUPS, do not overtighten the HUBS.

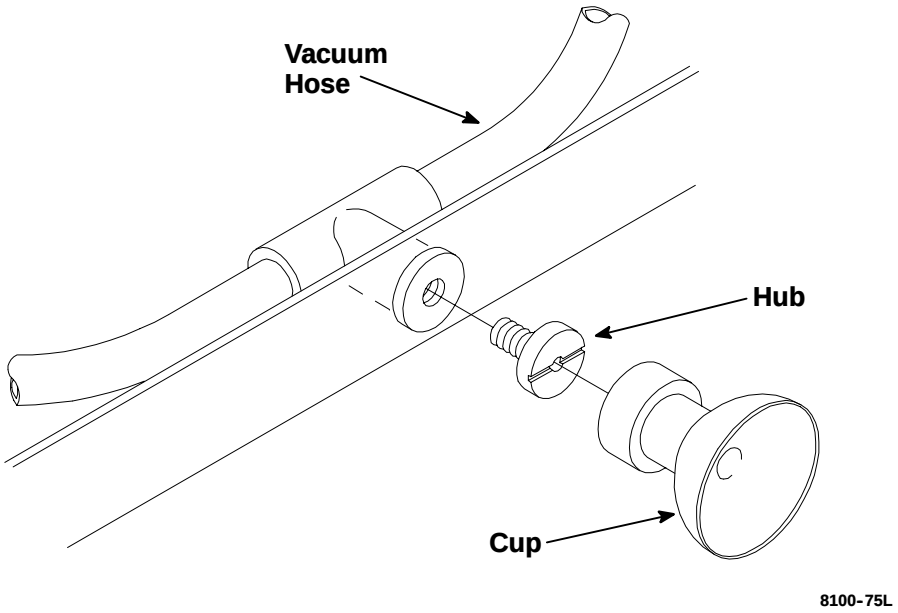


Figure 4-17. Replacing the PICKUP CUPS

4-6-3. FILM PICKUP HEEL PAD

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. DE–energize the IMAGER and disconnect the POWER CORD.
3. Remove the FILM PICKUP MODULE (4-6-1) and set it on a stable work surface.
4. Carefully peel off the PAD that covers the FILM PICKUP HEEL, taking care not to damage the 2 SENSOR ACTUATORS that extend through the HEEL (see Figure 4-18).

Caution

ISOPROPYL ALCOHOL is highly flammable. Follow the manufacturer's instructions for safe use and handling.

5. Use alcohol wipes to clean off the adhesive remaining on the HEEL after the PAD is removed. Make sure all the adhesive is removed.

Note

Make sure all the old adhesive is removed from the HEEL. Check the edges of the HEEL. If the new HEEL PAD does not adhere properly, it could hang up and cause problems.

6. Install a NEW PAD as follows:
   a. Peel off the protective layer from the adhesive surface (inside) of the PAD.
   b. Apply 1 edge of the PAD to the heel, and gradually press the adhesive surface of the PAD to the HEEL, working from 1 side toward the other side of the HEEL. Make sure you do not leave any air bubbles between the PAD and the HEEL.

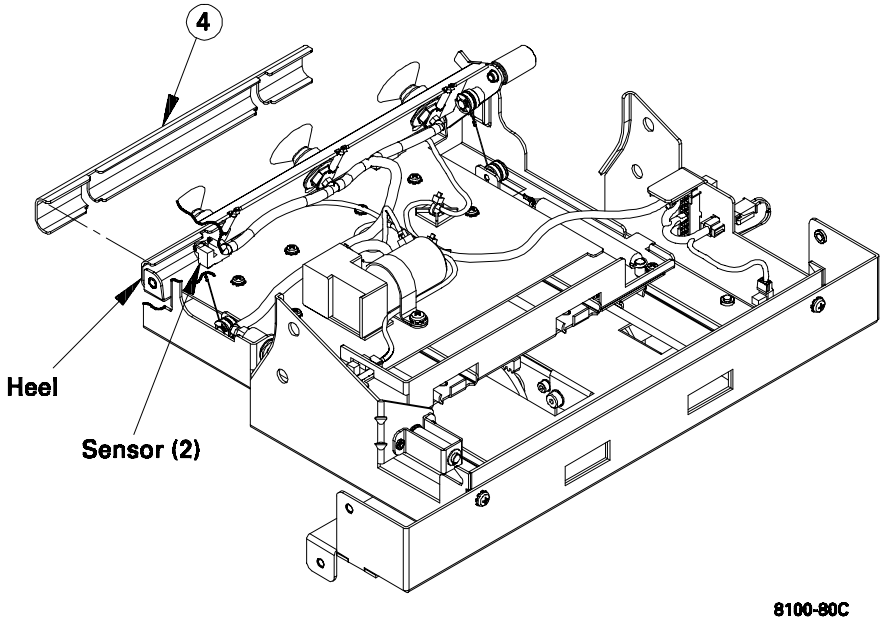


Figure 4-18. Replacing the PAD on the FILM PICKUP HEEL

4-6-4. FILM PICKUP OPTICAL SENSORS (S3, S4, S5, S10)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Remove the FILM PICKUP MODULE (4-6-1).
4. Position the FILM CARRIAGE as necessary to gain clear access to the SENSOR (Figure 4-19).
5. Remove the desired SENSOR as follows:
   a. Disconnect the ELECTRICAL PLUG from the SENSOR.

Caution

If the removed SENSOR is to be reinstalled, be very careful not to damage the MOUNTING CLIPS during removal. Also be careful not to damage the fragile ACTUATORS of FILM SURFACE SENSOR S4 and FILM OUT SENSOR S5 during disassembly and reassembly.

   b. Gently rock the SENSOR back and forth to disengage its MOUNTING CLIPS from the chassis sheet metal.
6. When replacing a SENSOR, make sure that the SENSOR CLIPS are properly seated in the sheet metal.

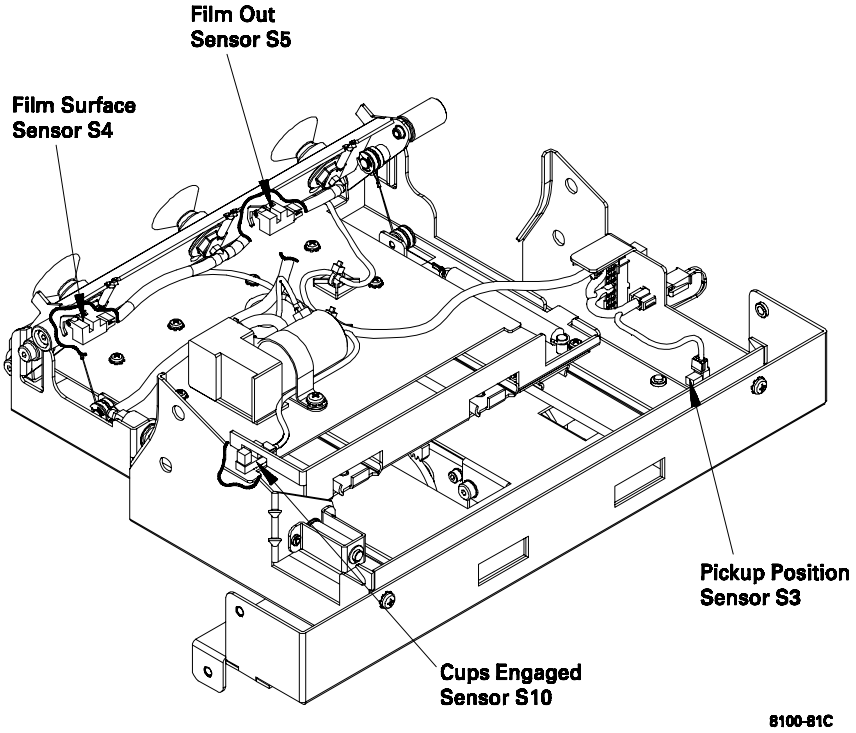


Figure 4-19. Locations of OPTICAL SENSORS

4-6-5. FILM PICKUP MOTOR (DCM2)

1. Remove the supply cartridge.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De–energize the IMAGER and disconnect the POWER CORD.
3. Remove the FILM PICKUP MODULE (4-6-1).
4. Disconnect the ELECTRICAL PLUG (Figure 4-20).
5. Remove the SPRING from the MOTOR BRACKET.
6. Remove 2 SHOULDER SCREWS and WASHERS. (The WASHERS may fall off after the SHOULDER SCREWS are removed.)
7. Remove the MOTOR.

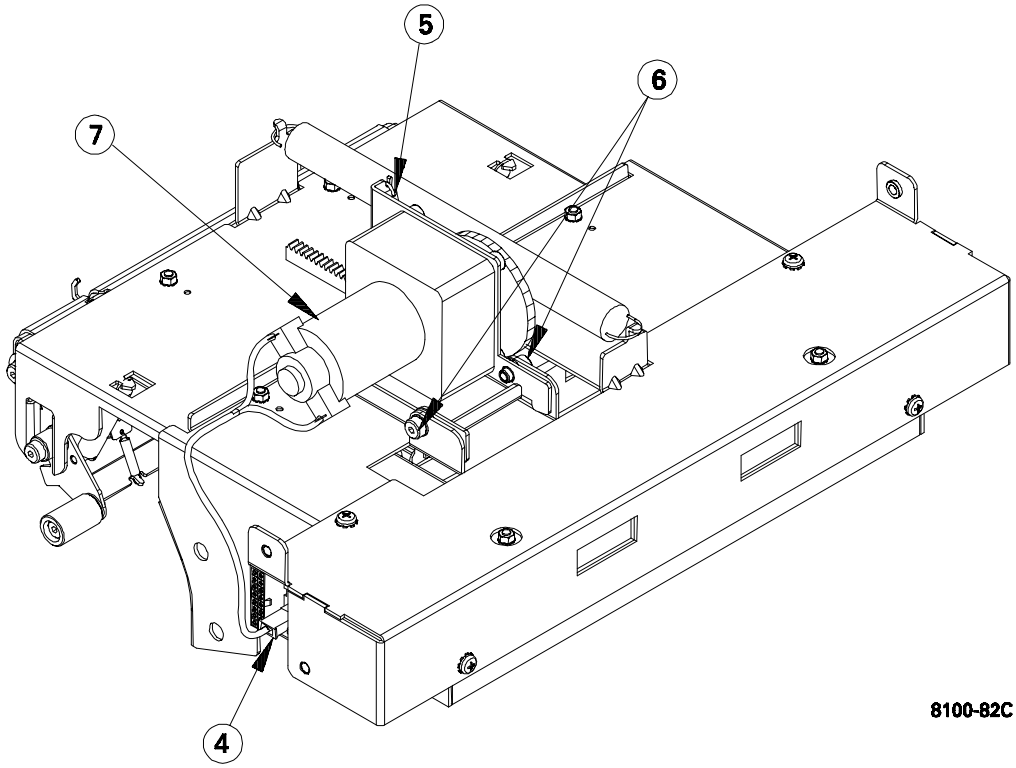


Figure 4-20. Replacing the PICKUP MOTOR

4-6-6. FILM PICKUP VACUUM PUMP

Disassembly

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Remove power and disconnect the POWER CORD.
3. Remove the FILM PICKUP MODULE (4-6-1).
4. Disconnect the VACUUM HOSE from the PUMP (see Figure 4-21).
5. Remove the ATTACHING SCREW securing the LOOP CLAMP, and remove the PUMP and ADHESIVE FOAM PAD.

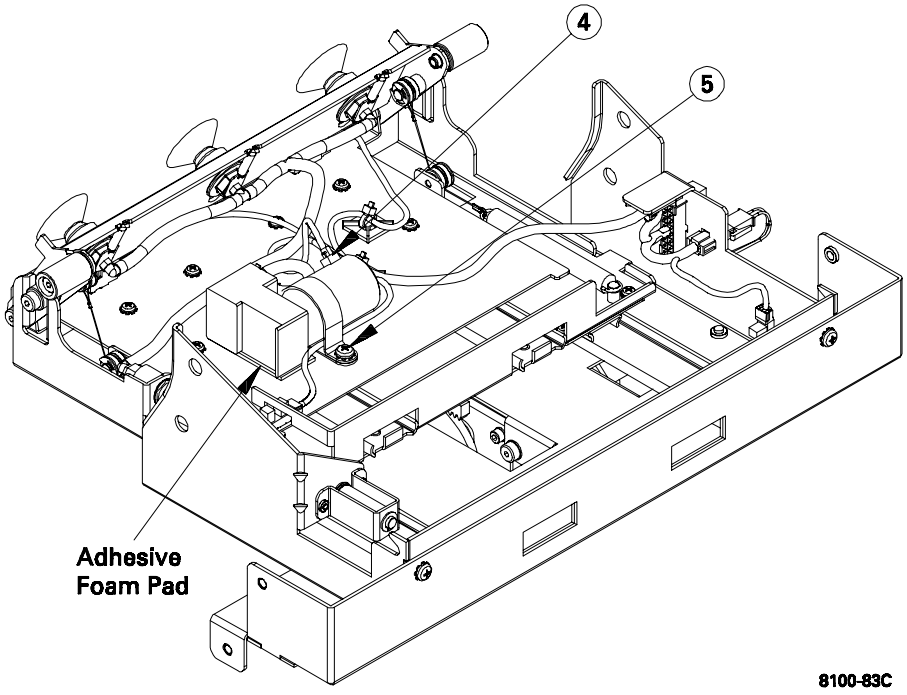


Figure 4-21. Removing the FILM PICKUP VACUUM PUMP

Reassembly

1. Before replacing a PUMP, remove any foam residue from the mounting location and clean the surface.
2. With the LOOP CLAMP on the PUMP, position the PUMP (with FOAM PAD) to establish the mounting location.
3. Peel the PROTECTIVE COVER from the FOAM and press down to adhere the FOAM (and PUMP) to the mounting surface. Then complete reassembly.
4. Attach the LOOP CLAMP with its MOUNTING SCREW.

4-7. Rollback Assembly

4-7-1. ROLLBACK MODULE

Disassembly

1. Remove the SUPPLY CARTRIDGE.
2. De–energize the IMAGER, but do not disconnect the POWER CORD yet.
3. Open the FRONT DOOR and remove the REAR PANEL of the IMAGER.
4. Actuate the SERVICE SWITCH by unscrewing the ACTUATOR BOLT (Rear View in Figure 4-22).
5. Energize the IMAGER while observing the ELEVATOR from the front of the IMAGER. The ELEVATOR will begin moving to its down position (Front View). (This will take a few minutes.)

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

6. When the ELEVATOR is all the way down (SENSOR blocked), de–energize the IMAGER and disconnect the POWER CORD.
7. Disconnect the ELECTRICAL PLUG for the ROLLBACK MOTOR (Rear View).
8. Disconnect the PLUG for the ROLLBACK SENSORS (Rear View).
9. Manually turn the ROLLBACK KNOB to move the ROLLBACK ROLLER to about the middle of the CARTRIDGE TRAY.
10. Remove the 2 SCREWS attaching the base of the ROLLBACK MODULE (Front View).
11. Remove 3 SCREWS attaching the TOP BRACKET of the ROLLBACK MODULE (Front View).
12. Disconnect the MicroComm CABLE from the RF TAG INTERFACE BOARD (Front View).

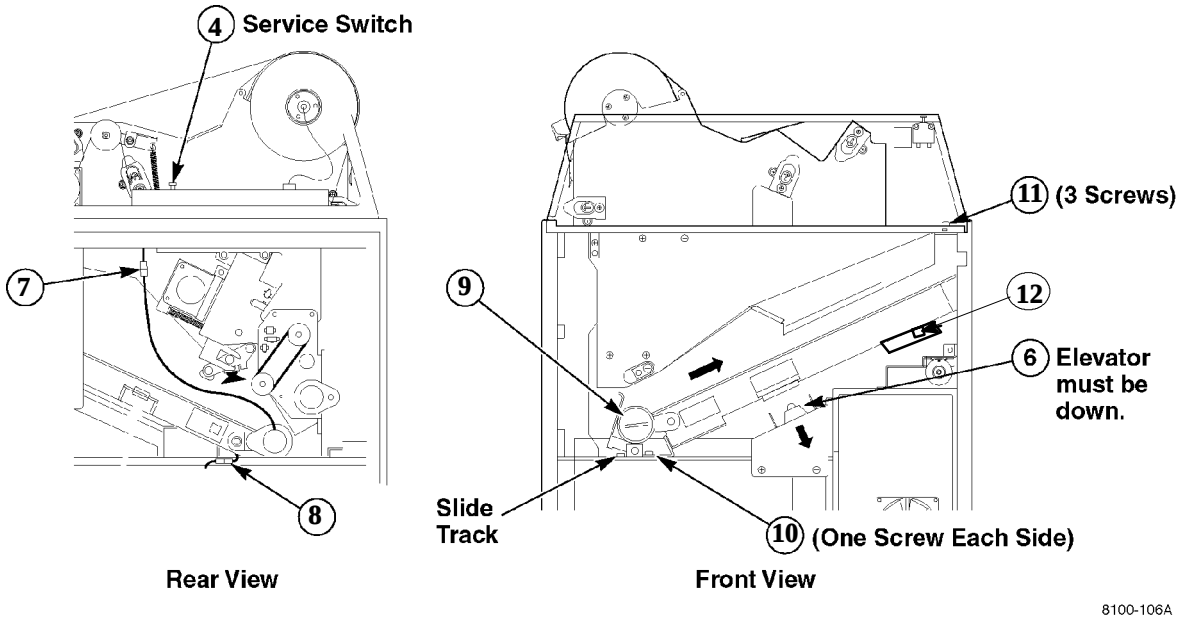


Figure 4-22. Removing the ROLLBACK MODULE

Continue on next page.

Caution

Do not to damage wiring when you slide the ROLLBACK MODULE out. The TENSION SPRINGS on the front and back of the MODULE may catch wiring if you are not careful.

13. Carefully slide the ROLLBACK MODULE out the front of the IMAGER and set it on a work surface.

Reassembly

Reassembly is essentially the reverse of disassembly. Make sure when you install the ROLLBACK MODULE that the bottom left of the assembly slides in along the SLIDE TRACK on the BASE (Front View).

Caution

Do not to damage wiring when you slide the ROLLBACK MODULE in. Make sure all CABLES are routed properly after reassembly.

4-7-2. ROLLBACK MOTOR (DCM1)

1. Remove the SUPPLY CARTRIDGE, de–energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Turn the ROLLBACK KNOB to position the ROLLBACK MOTOR for easy access to its ATTACHING SCREWS.
3. Remove 3 SCREWS to free the ROLLBACK MOTOR from its COUPLER BRACKET (Figure 4-23).

Note

To access the BOTTOM SCREW you will have to lift up the ROLLBACK ROLLER.

4. Remove the COUPLER VANE from the BRACKET.
5. Reassembly is essentially the reverse of disassembly.

Caution

Do not damage wiring when you install the ROLLBACK MODULE in the IMAGER. Make sure all CABLES are routed properly after reassembly.

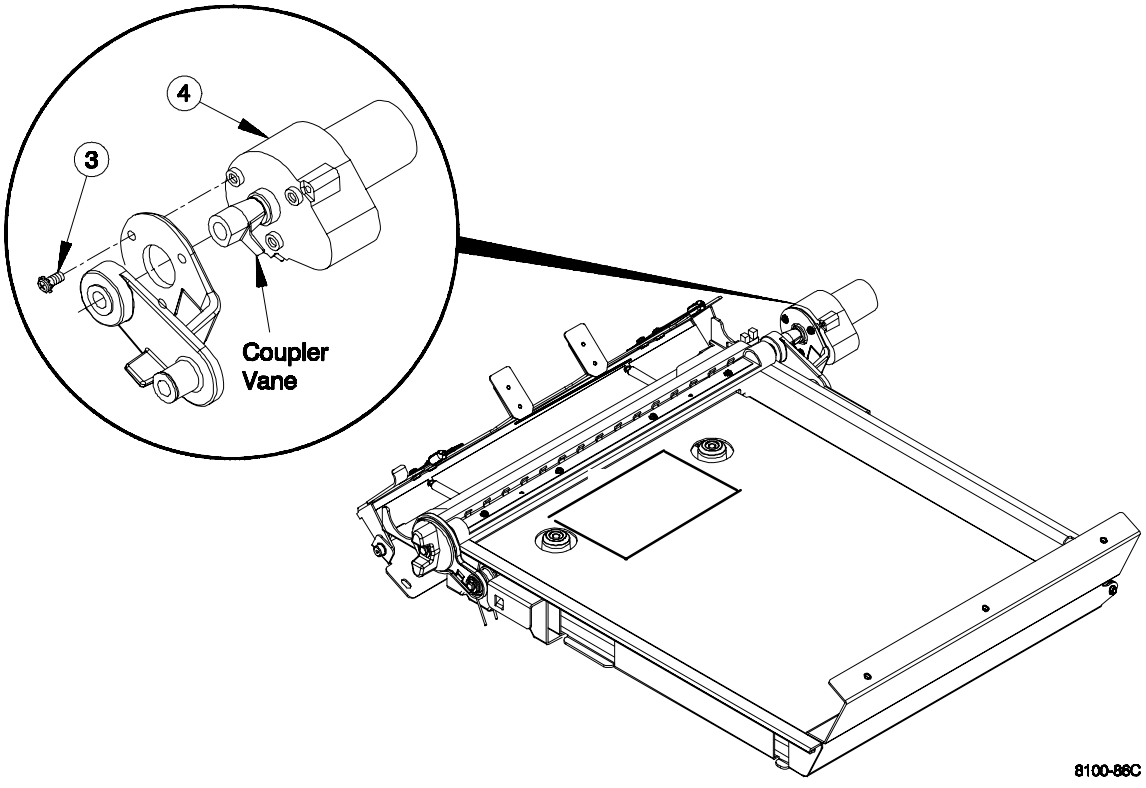


Figure 4-23. Removing the ROLLBACK MOTOR

4-7-3. CARTRIDGE PRESENT SENSOR (S1)

1. Remove the SUPPLY CARTRIDGE, de−energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Disconnect the ELECTRICAL PLUG from the CARTRIDGE PRESENT SENSOR (Figure 4-24).

Caution

If the same SENSOR is to be re−installed, be careful not to damage the MOUNTING CLIPS during removal.

3. Gently rock the CARTRIDGE PRESENT SENSOR back and forth to disengage the MOUNTING CLIPS.
4. When replacing the CARTRIDGE PRESENT SENSOR, make sure that the MOUNTING CLIPS are securely seated in the sheet metal.
5. Reassembly is the reverse of disassembly.

Caution

Do not damage the wiring when you install the ROLLBACK MODULE in the IMAGER. Make sure CABLES are routed properly after reassembly.

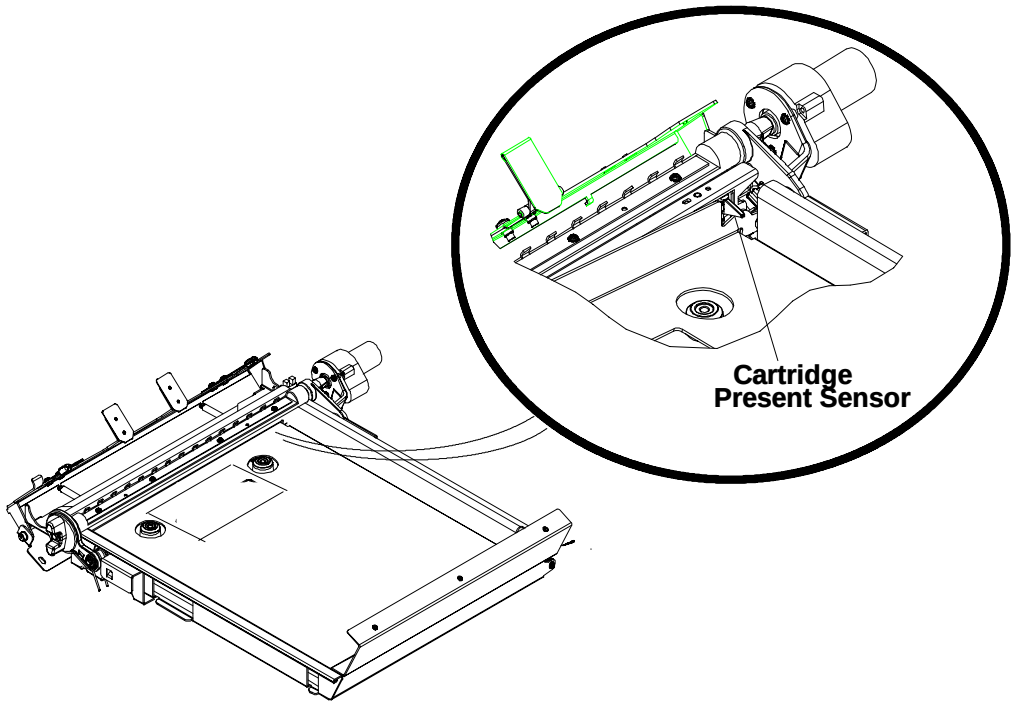


Figure 4-24. Removing the CARTRIDGE PRESENT SENSOR

4-7-4. ROLLBACK HOME SENSOR (S2)

1. Remove the SUPPLY CARTRIDGE, de-energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Disconnect the ELECTRICAL PLUG from the ROLLBACK HOME SENSOR (Figure 4-25).

Caution

If the same SENSOR is to be re-installed, be careful not to damage the MOUNTING CLIPS during removal.

3. Gently rock the SENSOR back and forth to disengage the MOUNTING CLIPS.
4. When replacing a ROLLBACK HOME SENSOR, make sure that the MOUNTING CLIPS are securely seated in the sheet metal.
5. Reassembly is essentially the reverse of disassembly.

Caution

Do not damage the wiring when you install the ROLLBACK MODULE in the IMAGER. Make sure all CABLES are routed properly after reassembly.

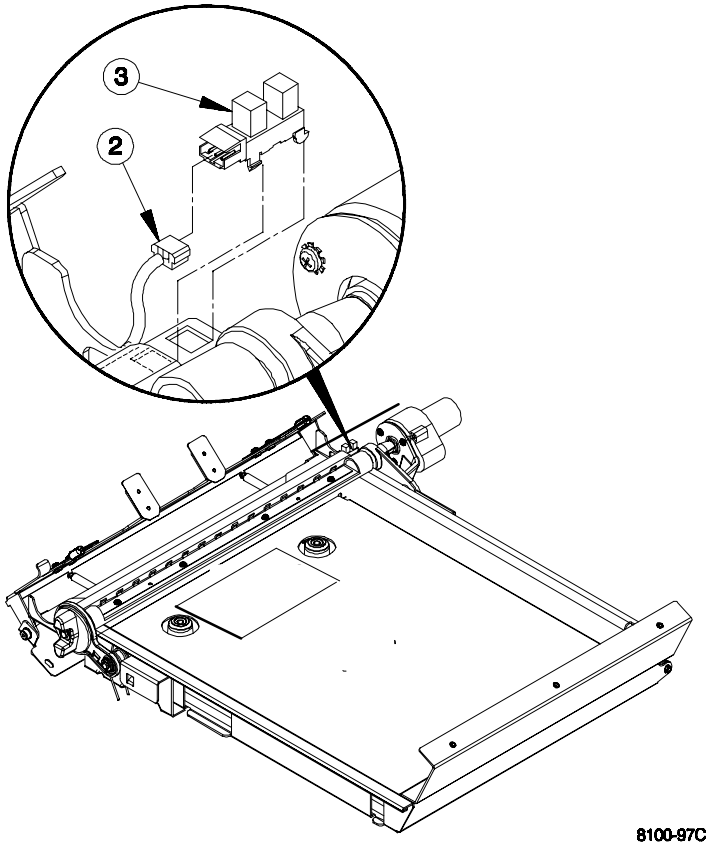


Figure 4-25. Removing the ROLLBACK HOME SENSOR

4-7-5. ROLLBACK OPEN SENSOR (S13)

1. Remove the SUPPLY CARTRIDGE, de-energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Carefully turn the ROLLBACK MODULE upside down.
3. Disconnect the ELECTRICAL PLUG from the ROLLBACK OPEN SENSOR (Figure 4-26).

Caution

If the same SENSOR is to be replaced, be careful not to damage the MOUNTING CLIPS during removal.

4. Gently rock the ROLLBACK OPEN SENSOR back and forth to disengage the MOUNTING CLIPS.
5. When replacing ROLLBACK OPEN SENSOR, make sure that the MOUNTING CLIPS are securely seated in the sheet metal.
6. Reassembly is the reverse of disassembly.

Caution

Do not damage the wiring when you install the ROLLBACK MODULE in the IMAGER. Make sure all CABLES are routed properly after reassembly.

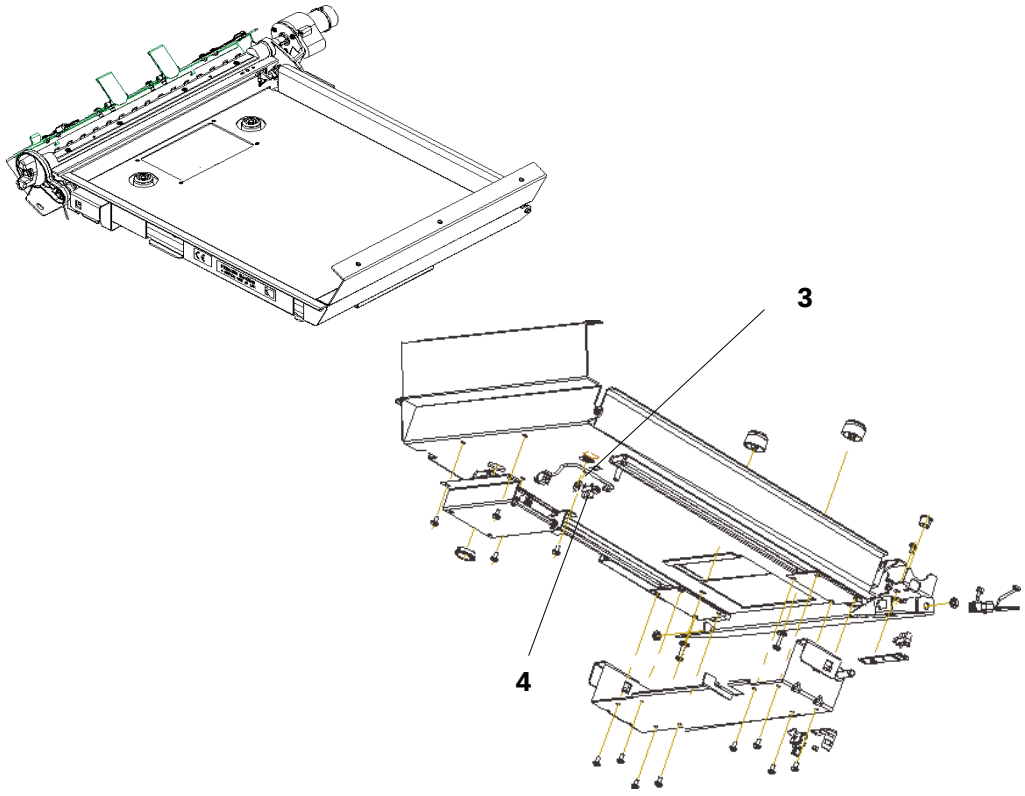


Figure 4-26. Removing the ROLLBACK OPEN SENSOR

4-7-6. RF TAG ASSEMBLY (RF TAG INTERFACE BOARD and RF READER BOARD)

Normally the RF TAG INTERFACE BOARD and the RF Reader Board are replaced as an assembly.

Caution

To avoid damaging sensitive electronic components, always wear a static strap when handling CIRCUIT BOARDS. Any CIRCUIT BOARD that is removed from the IMAGER must be returned to Kodak for rework, or disposed of properly. PRINTED CIRCUIT BOARDS contain lead.

1. Remove the SUPPLY CARTRIDGE, de–energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Carefully turn the ROLLBACK MODULE upside down.
3. Disconnect the 3 ELECTRICAL PLUGS from the RF TAG ASSEMBLY (Figure 4-25).
4. Remove 4 SCREWS and remove the RF TAG ASSEMBLY.
5. After installing the RF TAG ASSEMBLY and installing the ROLLBACK MODULE in the IMAGER, make sure that both SWITCHES on the RF TAG INTERFACE BOARD are set to the *down* position.

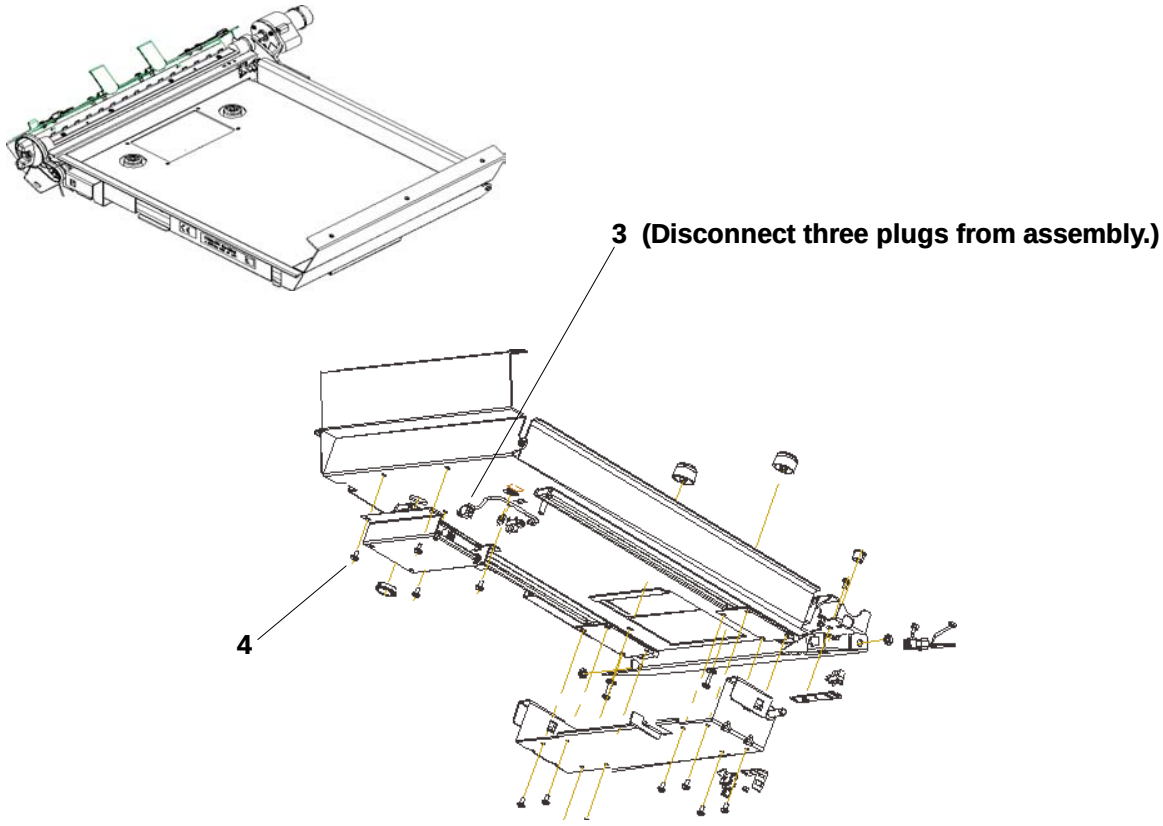


Figure 4-27. Removing the RF TAG ASSEMBLY

4-7-7. RF ANTENNA BOARD

1. Remove the SUPPLY CARTRIDGE, de-energize the IMAGER, and remove the ROLLBACK MODULE (4-7-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Turn the ROLLBACK KNOB to position the ROLLBACK CARRIAGE at about the center of the ROLLBACK MODULE.
3. Carefully turn the ROLLBACK MODULE upside down.
4. Remove 4 SCREWS to free the RF ANTENNA BOARD (Figure 4-26).
5. Disconnect the ANTENNA PLUG from the RF TAG INTERFACE BOARD.
6. Tie a STRING (or small WIRE) to the ANTENNA CABLE just below the PLUG. (During reassembly, this STRING or WIRE can be used to pull the ANTENNA CABLE back through the ROLLBACK ASSEMBLY and up through the HOLE in the BASE for reconnection to the RF TAG INTERFACE BOARD.)
7. While holding the attached STRING, drop the CABLE PLUG down through the HOLE in the BASE of the ROLLBACK MODULE. Then carefully pull the RF ANTENNA BOARD (with CABLE) from the ROLLBACK MODULE. (Do not pull the STRING or WIRE through.)
8. Untie the STRING from the CABLE and connect it to the CABLE of the new ANTENNA BOARD.
9. After installing a new ANTENNA BOARD in the BASE of the ROLLBACK MODULE, use the STRING to pull the CABLE through and out the HOLE in the BASE. Then connect the PLUG to the appropriate CONNECTOR on the RF TAG INTERFACE BOARD.

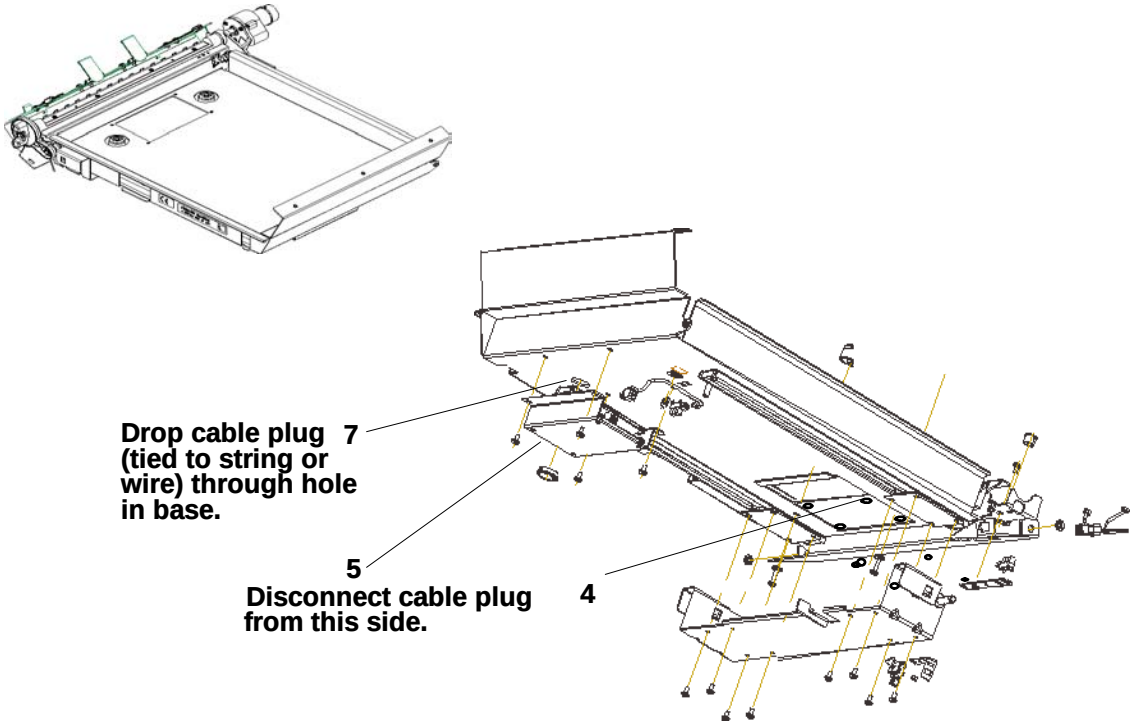


Figure 4-28. Removing the RF ANTENNA BOARD

4-8. ELEVATOR ASSEMBLY

4-8-1. ELEVATOR MODULE

Preliminary

1. Remove the SUPPLY CARTRIDGE.
2. De-energize the IMAGER, but do not disconnect the POWER CORD yet.
3. Actuate the SERVICE SWITCH by unscrewing the ACTUATOR SCREW.
4. Open the FRONT DOOR. Energize the IMAGER while observing the ELEVATOR from the front of the IMAGER. The ELEVATOR will begin moving to its down position.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

5. When the ELEVATOR is all the way down, de-energize the IMAGER and disconnect the POWER CORD.

Disassembly

1. Disconnect the CABLE PLUG from the ELEVATOR CHASSIS (Figure 4-29).
2. Disconnect the PLUG INSERT from the ELEVATOR HOME SENSOR, and pull the WIRES out through the side of the ELEVATOR CHASSIS.
3. Remove 2 ATTACHING SCREWS.
4. Pull the PIN and pivot the MOTOR forward so the threaded ELEVATOR SHAFT clears the MOUNTING BASE for the ELEVATOR. Then remove the ELEVATOR MODULE from the IMAGER.

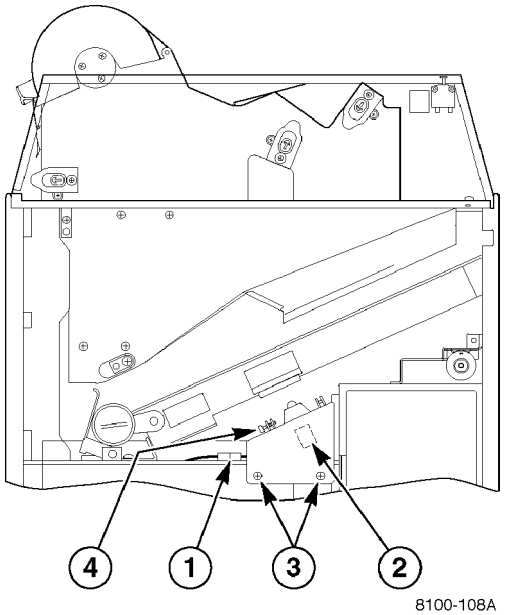


Figure 4-29. Removing the ELEVATOR MODULE

4-8-2. ELEVATOR HOME SENSOR (S12)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Open the FRONT DOOR.

Note

The ELEVATOR HOME SENSOR can be removed and installed without removing the ELEVATOR MODULE from the IMAGER. However, you can gain easier access to the ELEVATOR HOME SENSOR by removing the ELEVATOR MODULE (4-8-1).

4. Disconnect the ELECTRICAL PLUG INSERT from the CONNECTOR on the SENSOR (Figure 4-30).

Caution

If the same SENSOR is to be replaced, be careful not to damage the MOUNTING CLIPS during removal.

5. Gently rock the ELEVATOR HOME SENSOR back and forth to disengage the MOUNTING CLIPS.
6. When installing the ELECTRICAL PLUG INSERT, make sure that the SENSOR CLIPS are properly seated in the sheet metal.

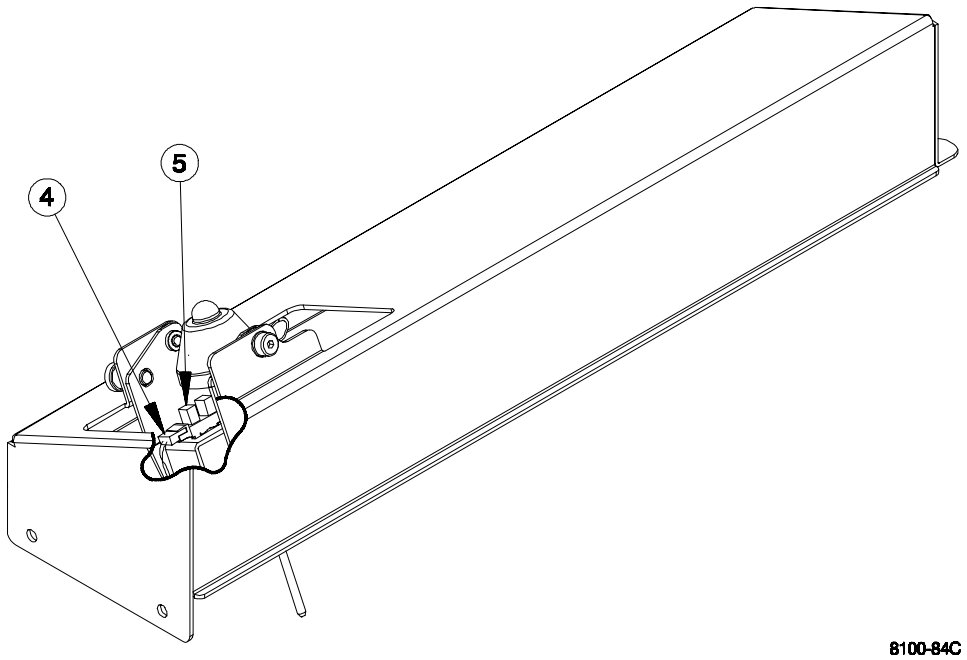


Figure 4-30. Removing the ELEVATOR HOME SENSOR

4-8-3. ELEVATOR MOTOR AND HUB ASSEMBLY (Step 8)

1. Remove the SUPPLY CARTRIDGE, de-energize the IMAGER, and remove the ELEVATOR MODULE (4-8-1).

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. Disconnect the ELECTRICAL PLUG from the ELEVATOR CHASSIS (Figure 4-31).
3. Free the MOTOR ELECTRICAL WIRES from the MOUNT.
4. Remove 2 SCREWS to free the MOTOR.

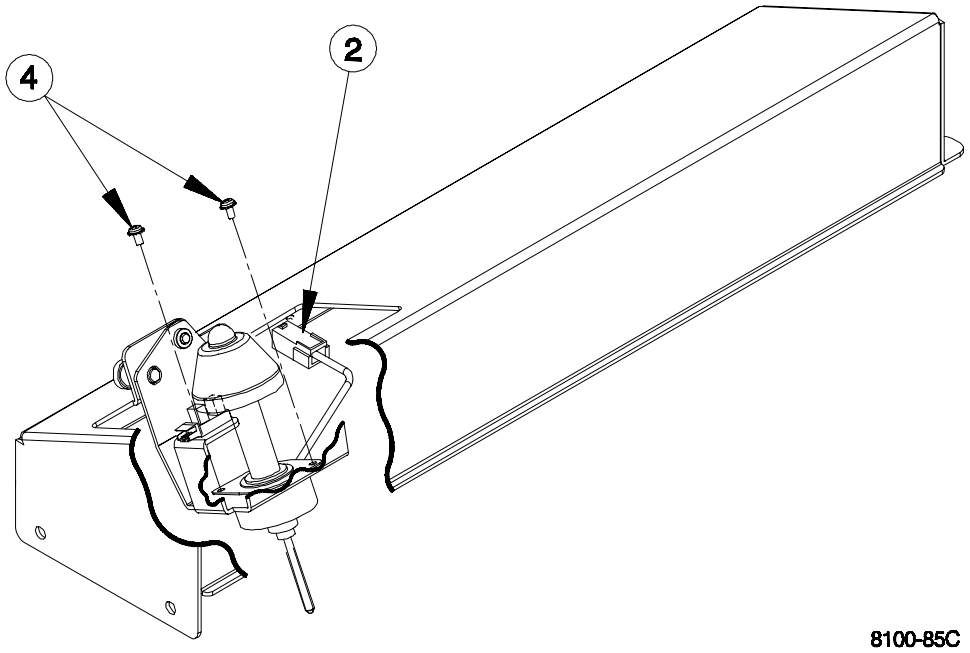


Figure 4-31. Removing the Elevator Motor and Hub Assembly

4-9. FEED ROLLER ASSEMBLY

4-9-1. FEED ROLLER MODULE

1. Remove the SUPPLY CARTRIDGES.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Open the FRONT DOOR and remove the REAR PANEL.
4. Check that the FILM PICKUP MODULE is in the up position (see paragraph 4-6-1, step 5).
5. Remove 2 SCREWS from the front (see Front View in Figure 4-32).
6. Disconnect 3 ELECTRICAL CABLES (see Rear View in Figure 4-32).
7. Remove 2 SCREWS from the back side (Rear View), while supporting the FEED ROLLER MODULE.
8. Carefully lift and remove the MODULE from the machine.

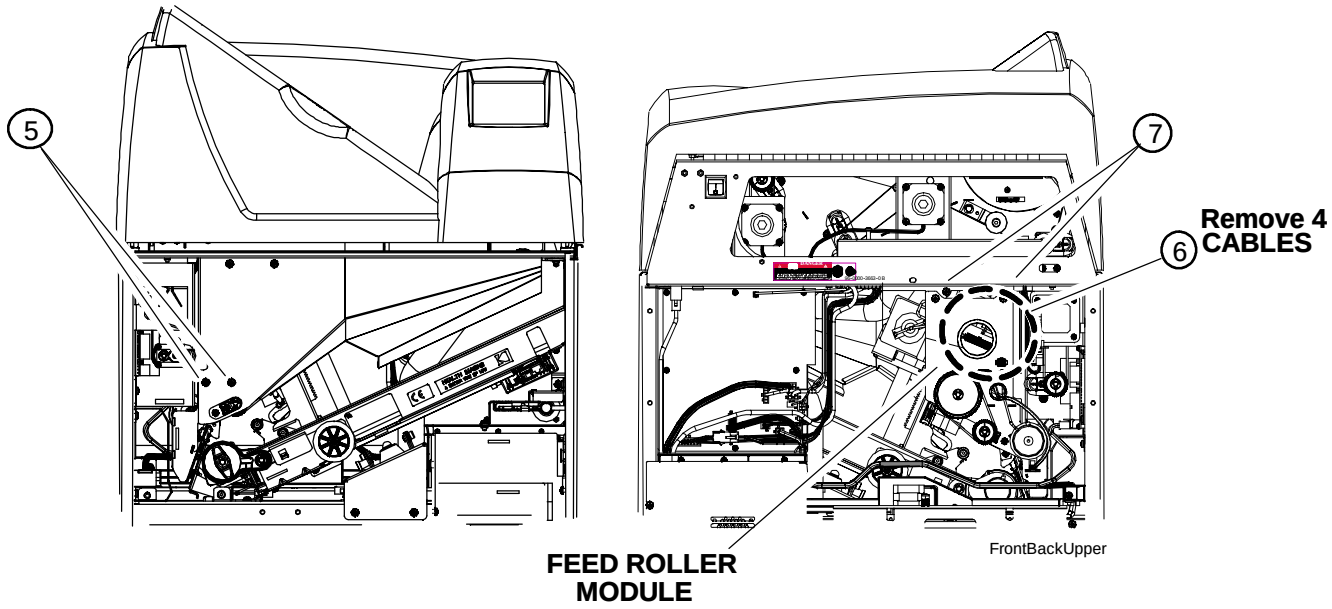


Figure 4-32. Removing the FEED ROLLER MODULE

4-9-2. FEED ROLLER OPEN SENSOR (S11)

Preliminary

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the FEED ROLLER MODULE (4-9-1) and the FEED ROLLER OPEN MOTOR (4-9-3).

Disassembly

1. Disconnect the ELECTRICAL PLUG INSERT from the CONNECTOR on the FEED ROLLER OPEN SENSOR.

Caution

If the same SENSOR is to be re–installed, be careful not to damage the MOUNTING CLIPS during removal.

2. Gently rock the FEED ROLLER OPEN SENSOR back and forth to disengage the MOUNTING CLIPS (Figure 4-29).
3. When installing the FEED ROLLER OPEN SENSOR, make sure that the SENSOR CLIPS are properly seated in the sheet metal.

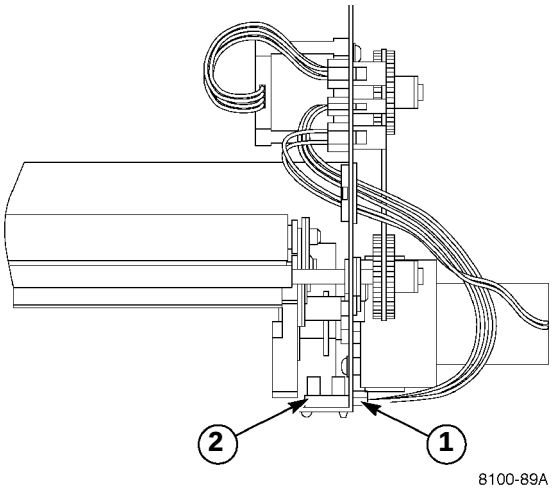


Figure 4-33. Removing the FEED ROLLER OPEN SENSOR

4-9-3. FEED ROLLER OPEN MOTOR (DCM4)

Special Tools

9-volt DRY CELL BATTERY

Preliminary

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the FEED ROLLER MODULE (4-9-1).

Disassembly

1. Move the VANE out of the SENSOR:
   a. Use a 9-volt DRY-CELL BATTERY to operate the FILM FEED MOTOR to drive the VANE out of the SENSOR. (See positions of the SENSOR VANE in Figure 4-34.)

Note

Insert a PAPER CLIP in each of the 2–PIN SOCKETS of the MOTOR CONNECTOR (Figure 4-34), and place the BATTERY TERMINALS across the 2 PAPER CLIPS to apply power to the FILM FEED MOTOR.

   b. When the VANE has moved out of the SENSOR, remove the BATTERY and PAPER CLIPS.
2. Loosen the SETSCREW that attaches the VANE and CAM to the MOTOR SHAFT (Figure 4-34).
3. Pull the VANE and CAM from the MOTOR SHAFT.
4. Remove the MOTOR ELECTRICAL CONNECTOR from the CHASSIS.
5. Remove 3 ATTACHING SCREWS and remove the FILM FEED MOTOR.

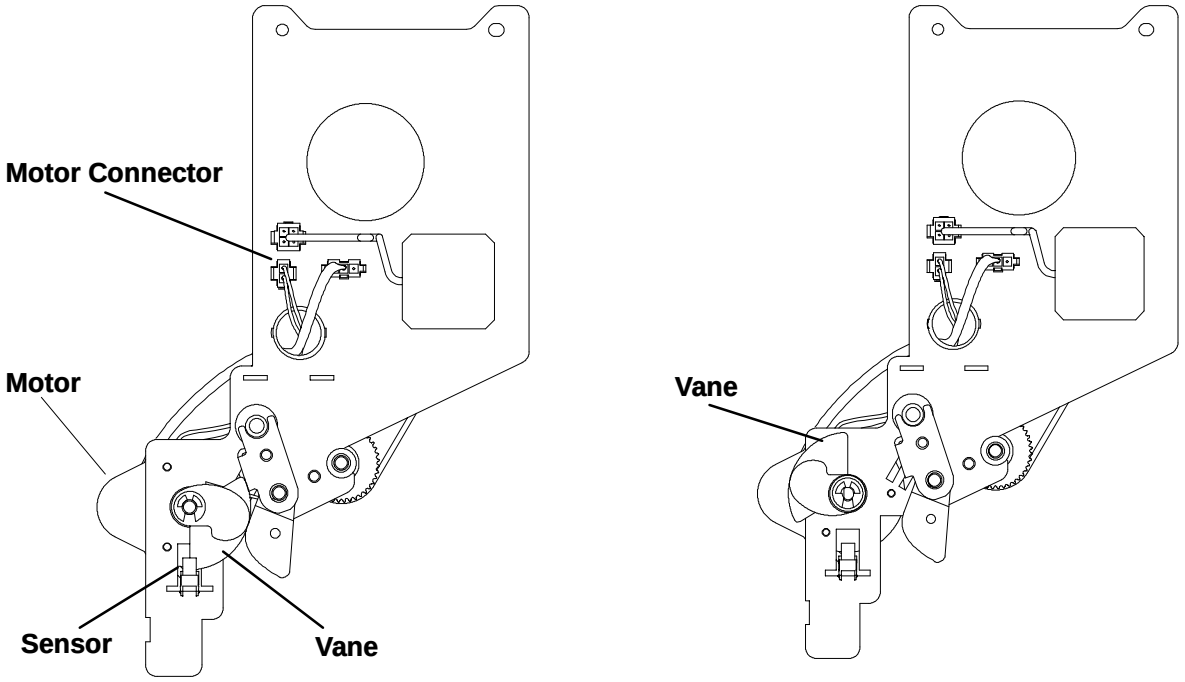
Reassembly

1. Position the FILM FEED MOTOR as shown in Figure 4-34 and attach it with the 3 SCREWS.
2. Make sure that the flat on the MOTOR SHAFT is positioned so that the FEED ROLLER OPEN SENSOR will not interfere with installation of the CAM and VANE on the MOTOR SHAFT.

Note

If you have to reposition the MOTOR SHAFT, use a 9-volt BATTERY to drive the FILM FEED MOTOR as described in step 1 in **Disassembly** above.

3. Install the CAM and VANE on the MOTOR SHAFT and secure it by tightening the SETSCREW against the flat of the MOTOR SHAFT.
4. Install the MOTOR ELECTRICAL CONNECTOR in the CHASSIS, and replace the MOTOR DRIVE BELT.



Sensor Home Position

Vane Rotated 180

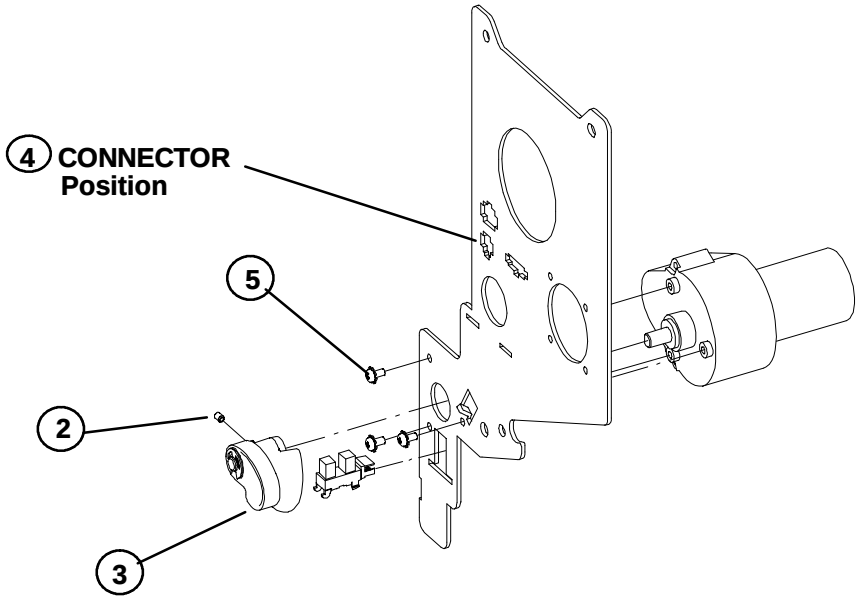


Figure 4-34. Replacing the FEED ROLLER OPEN MOTOR

4-9-4. FEED ROLLER MOTOR) and PULLEY

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Remove the FEED ROLLER MODULE (4-9-1).
4. Remove the ELECTRICAL CONNECTOR for the FEED ROLLER MOTOR from the CHASSIS (Figure 4-35).
5. Remove 3 of the ATTACHING SCREWS fro the FEED ROLLER MOTOR and rotate the MOTOR down to loosen the DRIVE BELT.
6. Remove the DRIVE BELT.
7. Remove the E-RING, and remove the PULLEY and DOWEL PIN.
8. Remove the remaining ATTACHING SCREW and remove the FEED ROLLER MOTOR.

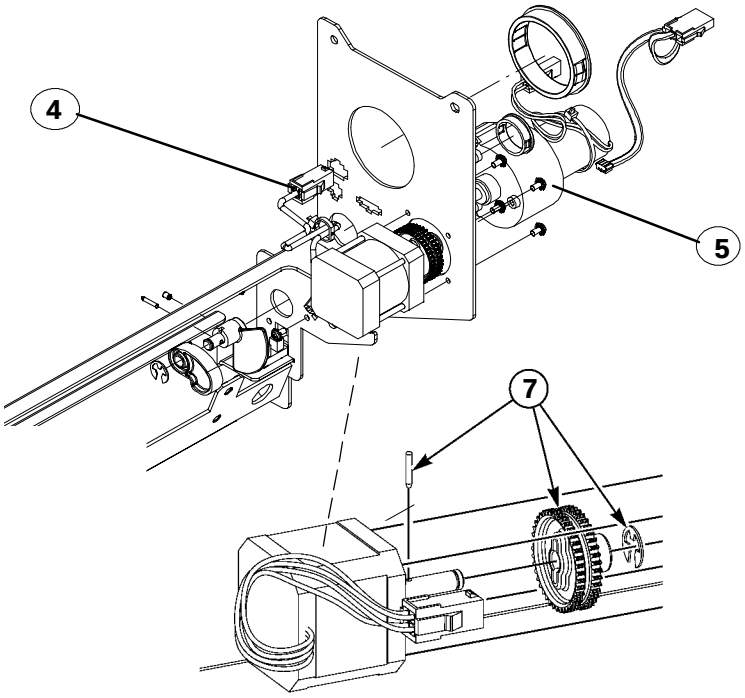


Figure 4-35. Removing the FEED ROLLER MOTOR

4-9-5. Feed Roller Torsion Springs

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the FEED ROLLER MODULE (4-9-1).

Note

Be aware that the 2 TORSION SPRINGS are not identical. For reference in reassembly, note the configuration of the SPRINGS as you remove them.

4. For each TORSION SPRING: Remove the end of the SPRING from the CHASSIS RETAINER to release tension (Figure 4-36).
5. For each TORSION SPRING:
   a. Remove the SCREW securing the SPRING and pivot to the FEED ROLLER BRACKET.
   b. Slide the SPRING, pivot free of the BRACKET.
   c. Remove the SPRING.

Note

In reassembly, make sure the FLANGES of the PIVOTS (Figure 4-32) for the TORSION SPRINGS are seated flat against the FEED ROLLER BRACKET.

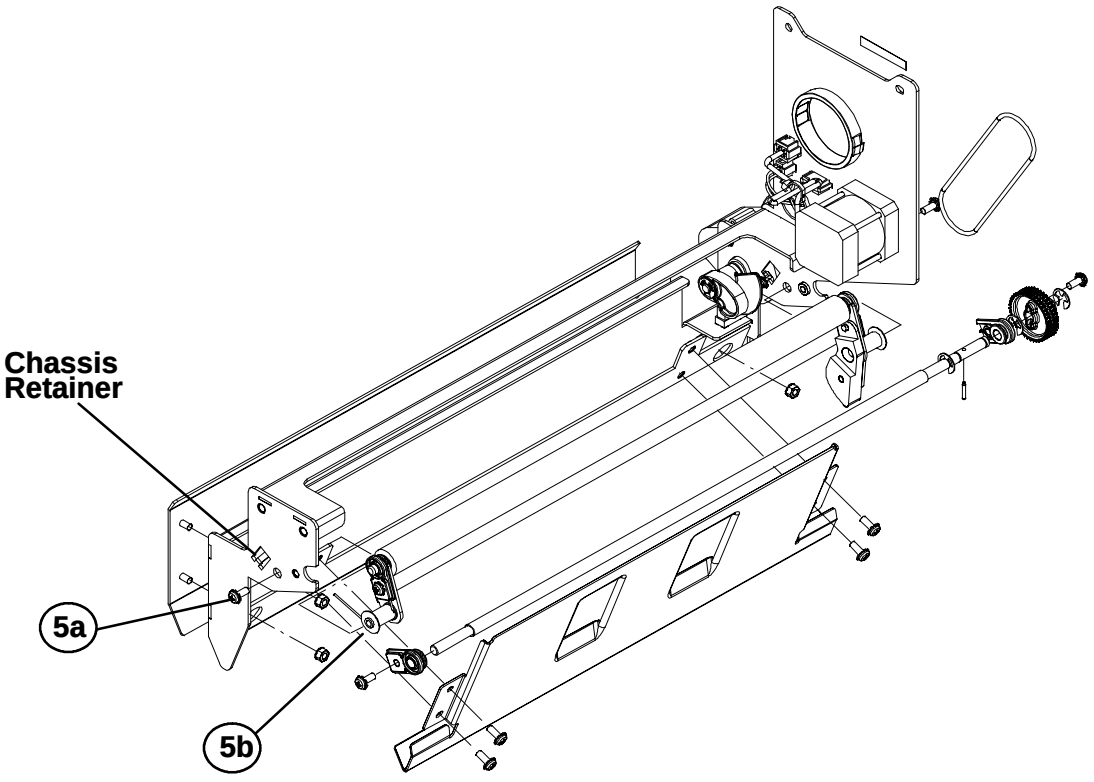


Figure 4-36. Removing the Feed Roller Torsion Springs

4-10. VERTICAL TRANSPORT ASSEMBLY

4-10-1. VERTICAL TRANSPORT MODULE

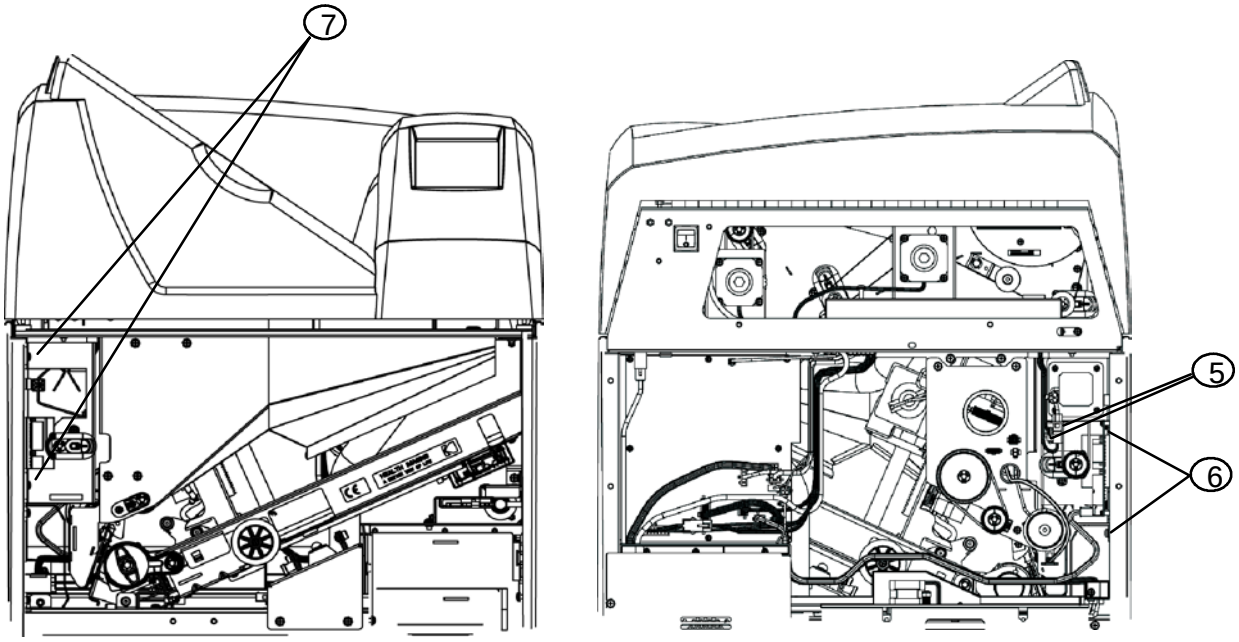
Disassembly

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Open the FRONT DOOR.
4. Remove the REAR PANEL of the IMAGER.
5. At the rear of the IMAGER, disconnect 2 ELECTRICAL CONNECTORS (SENSOR and MOTOR). See the Rear View in Figure 4-37.
6. At the rear of the IMAGER, remove 2 SCREWS (Rear View).
7. At the front of the IMAGER, remove 2 SCREWS (Front View).
8. From the front of the IMAGER, carefully slide the MODULE out.



Front View **Rear View**

Figure 4-37. Removing the VERTICAL TRANSPORT MODULE

4-10-2. VERTICAL TRANSPORT SENSOR (S8)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the VERTICAL TRANSPORT MODULE (4-10-1).
4. Disconnect the ELECTRICAL PLUG from the SENSOR (Figure 4-38).

Caution

If the same SENSOR is to be replaced, do not damage the MOUNTING CLIPS during removal.

5. Gently rock the SENSOR back and forth to disengage the MOUNTING CLIPS.
6. When replacing a SENSOR, check that the sensor CLIPS are properly seated in the sheet metal.

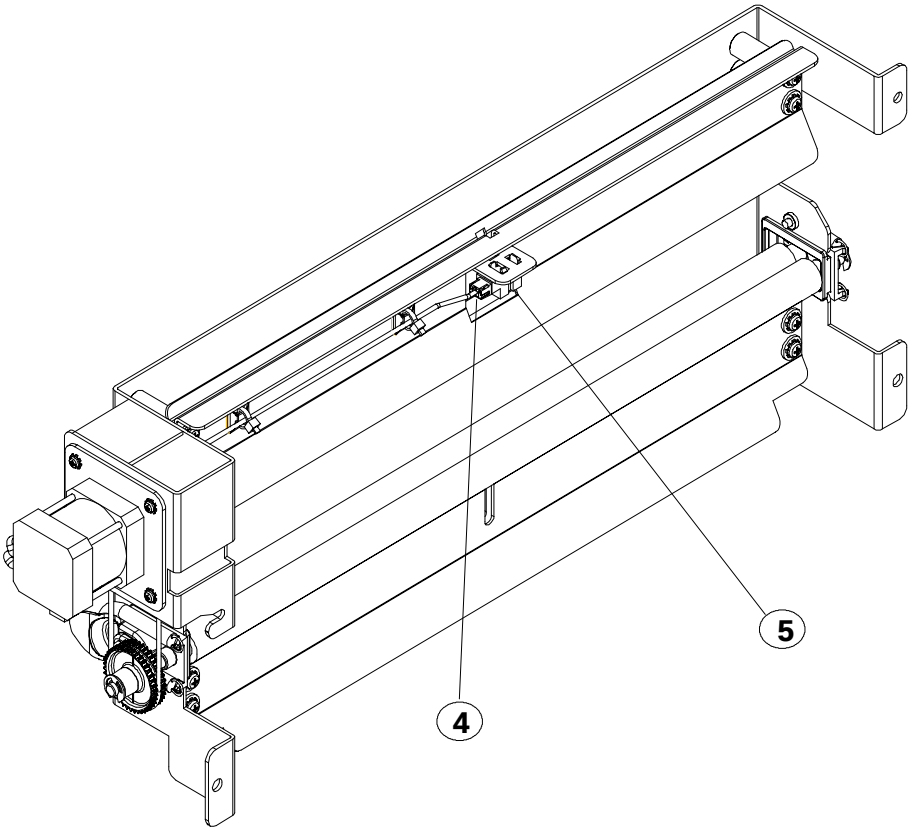


Figure 4-38. Removing the Vertical Transport Sensor

4-10-3. VERTICAL TRANSPORT MOTOR (Step 6)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Remove the UPPER VERTICAL TRANSPORT MODULE (see paragraph 4-10-1).
4. Disconnect the ELECTRICAL PLUG from the MOTOR (see Figure 4-39).
5. While supporting the MOTOR with 1 hand, remove 4 SCREWS from the MOTOR MOUNTING PLATE.
6. Slightly lower the MOTOR to provide slack in the BELT, and remove the BELT from the MOTOR SPROCKET.
7. Remove the MOTOR and SPROCKET with MOUNTING PLATE.
8. Remove 4 SCREWS to separate the MOUNTING PLATE from the MOTOR and SPROCKET ASSEMBLY.

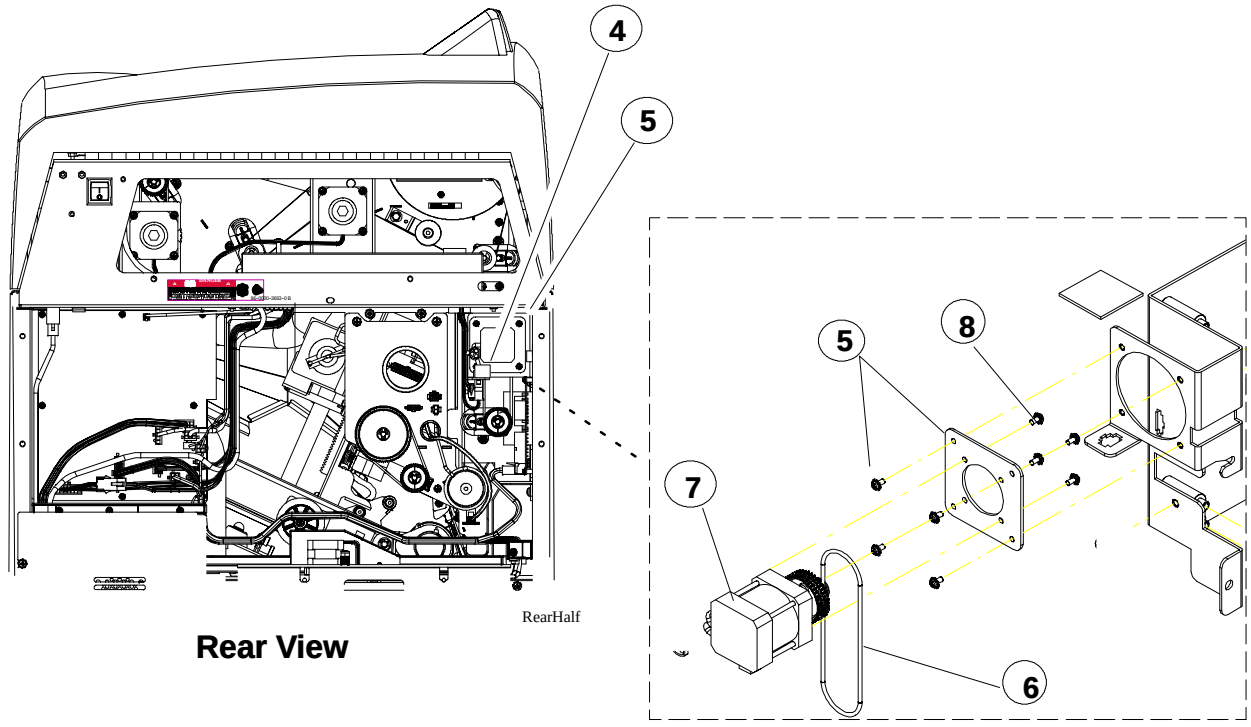


Figure 4-39. Removing the UPPER VERTICAL TRANSPORT MOTOR

4-11. IMAGING (EXPOSURE) ASSEMBLY

4-11-1. IMAGING MODULE

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De–energize the IMAGER and disconnect the POWER CORD.
3. Open the FRONT DOOR.
4. Remove the REAR PANEL of the IMAGER.
5. At the front of the IMAGER, remove 2 ATTACHING SCREWS (Front View).
6. At the rear of the IMAGER, remove 2 ATTACHING SCREWS (Rear View).
7. Slide the end of IMAGING MODULE about 4 inches outside the rear of the IMAGER as shown in Figure 4-40.
8. Loosen the 2 SCREWS attaching the connector and disconnect the flat CABLE (Rear View).
9. Disconnect the 4 CABLE PLUGS from the right side (Rear View).
10. Carefully slide the IMAGING MODULE most of the way out of the IMAGER and lower the end to the floor while the other end remains in the IMAGER.

Caution

The IMAGING MODULE weighs 22 – 27 kg (50 – 60 lbs.).

11. Carefully lift the IMAGING MODULE and gently set it on a flat working surface.

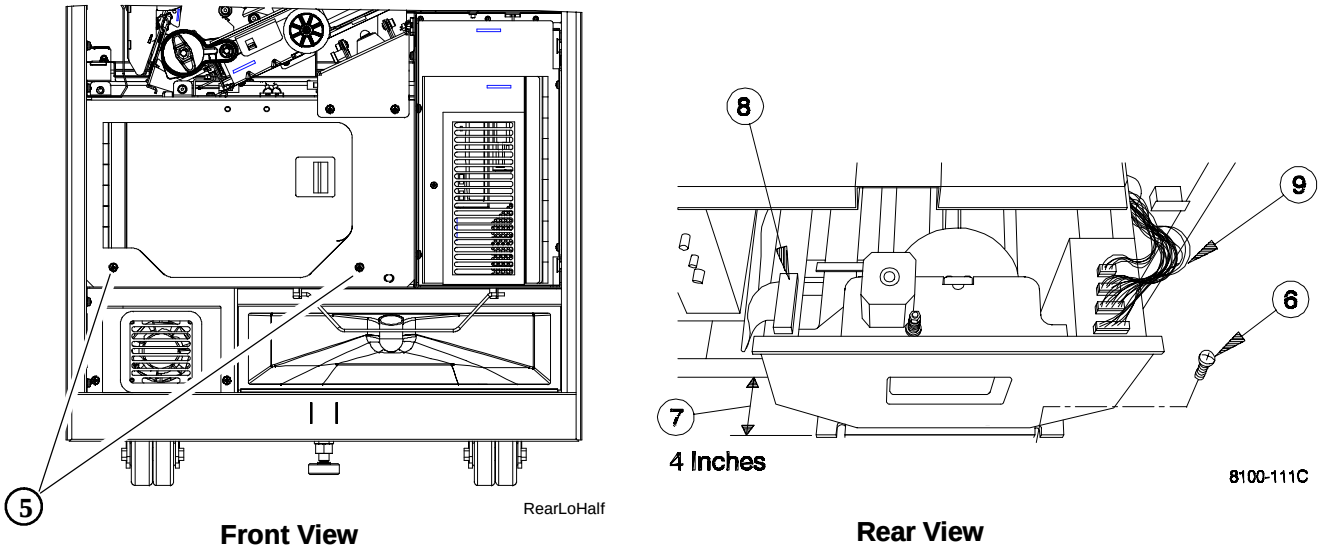


Figure 4-40. Removing the IMAGING MODULE

4-11-2. SCANNER ASSEMBLY

Disassembly

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Unplug the flat CABLE from the SCANNER (Figure 4-41).
5. Loosen both ATTACHING SCREWS from the flat CABLE CLAMP closest to the looped end of the flat CABLE. Then remove the CLAMP to free the looped end of the CABLE.
6. Disconnect the ELECTRICAL PLUG from the OPTICS HOME SENSOR.
7. Unclip and push down the ELECTRICAL CONNECTOR for the TRANSLATION MOTOR, to free it from the PLATEN CONNECTOR PLATE.
8. Remove the 2 SCANNER ASSEMBLY ATTACHING SCREWS from the end of the IMAGING MODULE.
9. Loosen the 2 ATTACHING SCREWS and remove the 2 blocks securing the other end of the SCANNER ASSEMBLY.
10. With the SCANNER slid back to the approximate position shown in Figure 4-41, carefully lift the SCANNER ASSEMBLY from the PLATEN ASSEMBLY and place it on a work bench.

Reassembly

Reassembly is the reverse of disassembly.

1. Check the following precautions:

Caution

The FLAT CABLE must be clamped and positioned straight as shown in Figure 4-41. Clamp positions are marked on the CABLE. The looped end must have a 180-degree twist where it PLUGS into the SCANNER, as shown in the illustration.

Caution

Route all WIRES away from the OPTICS HOME SENSOR and secure the WIRES to the POST in the SCANNER MODULE with TIE–WRAPS. See Figure 4-41. If the WIRES are not tie wrapped, they can get caught in the SENSOR causing damage to the WIRES and spreading debris throughout the LASER IMAGER.

2. After the cable is positioned, manually run the SCANNER ASSEMBLY all the way forward and then all the way back to check that there is enough slack in the flat CABLE.

Caution

ISOPROPYL ALCOHOL is highly flammable. Follow the manufacturer’s instructions for safe use and handling.

3. After reassembly, use ISOPROPYL ALCOHOL and a CLEANING PAD to clean the surfaces of the RAILS and the FLYWHEEL.
4. After reassembly, do the following adjustments:
   - Optics Translation Speed and SOP Delay Adjustment (paragraph 3-4).
   - Laser Dynamic Range Adjustment (paragraph 3-6).

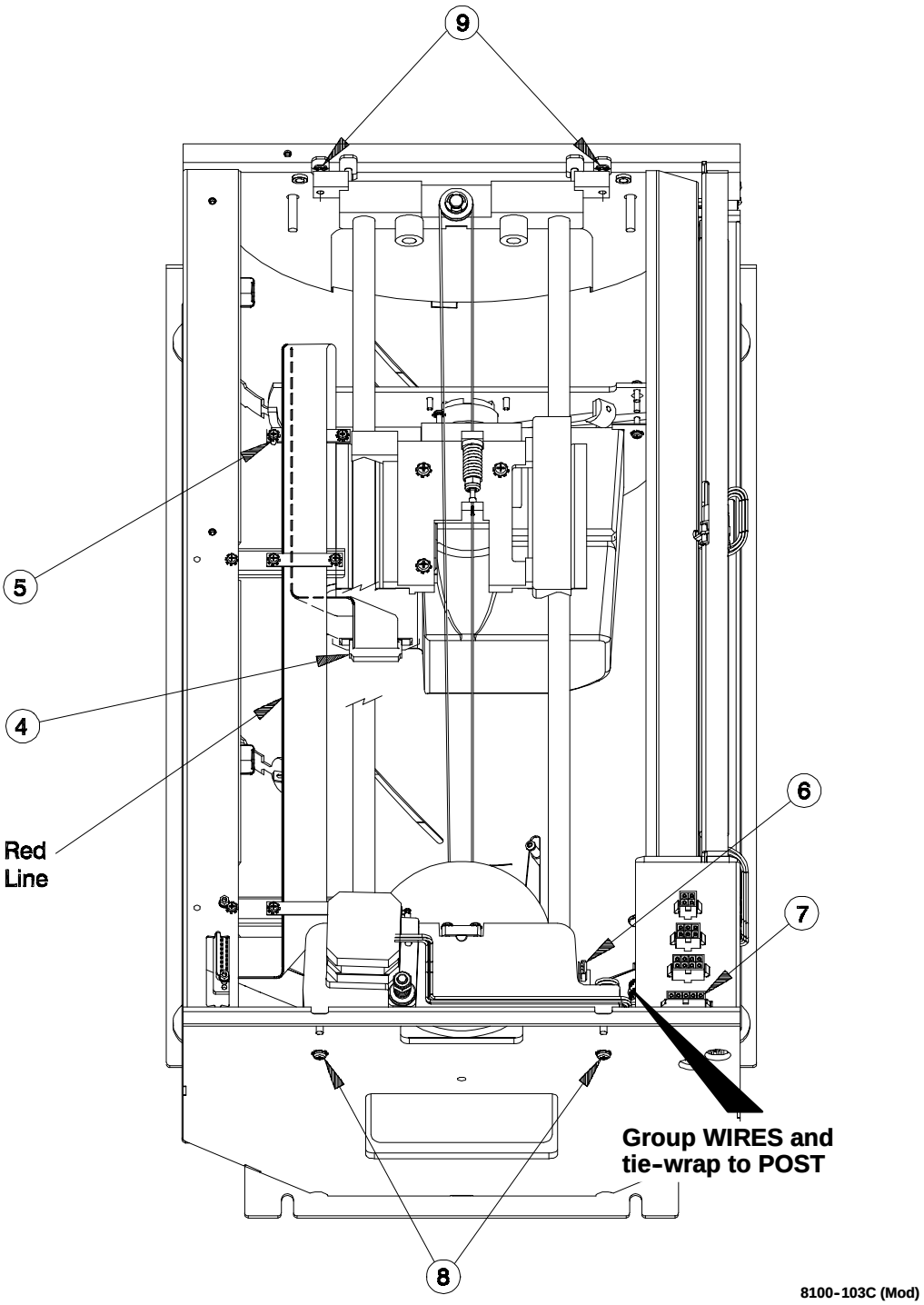


Figure 4-41. Removing the SCANNER ASSEMBLY

4-11-3. PLATEN FILM SENSOR (S6)

Disassembly

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Disconnect the ELECTRICAL PLUG from the SENSOR (Figure 4-42).

Caution

If the same SENSOR is to be replaced, be careful not to damage the MOUNTING CLIPS during removal.

5. Gently rock the SENSOR back and forth to disengage the MOUNTING CLIPS.

Reassembly

6. When replacing a SENSOR, make sure that the MOUNTING CLIPS are securely seated in the sheet metal.
7. Check that the SENSOR ACTUATOR ARM operates freely in its SLOT.

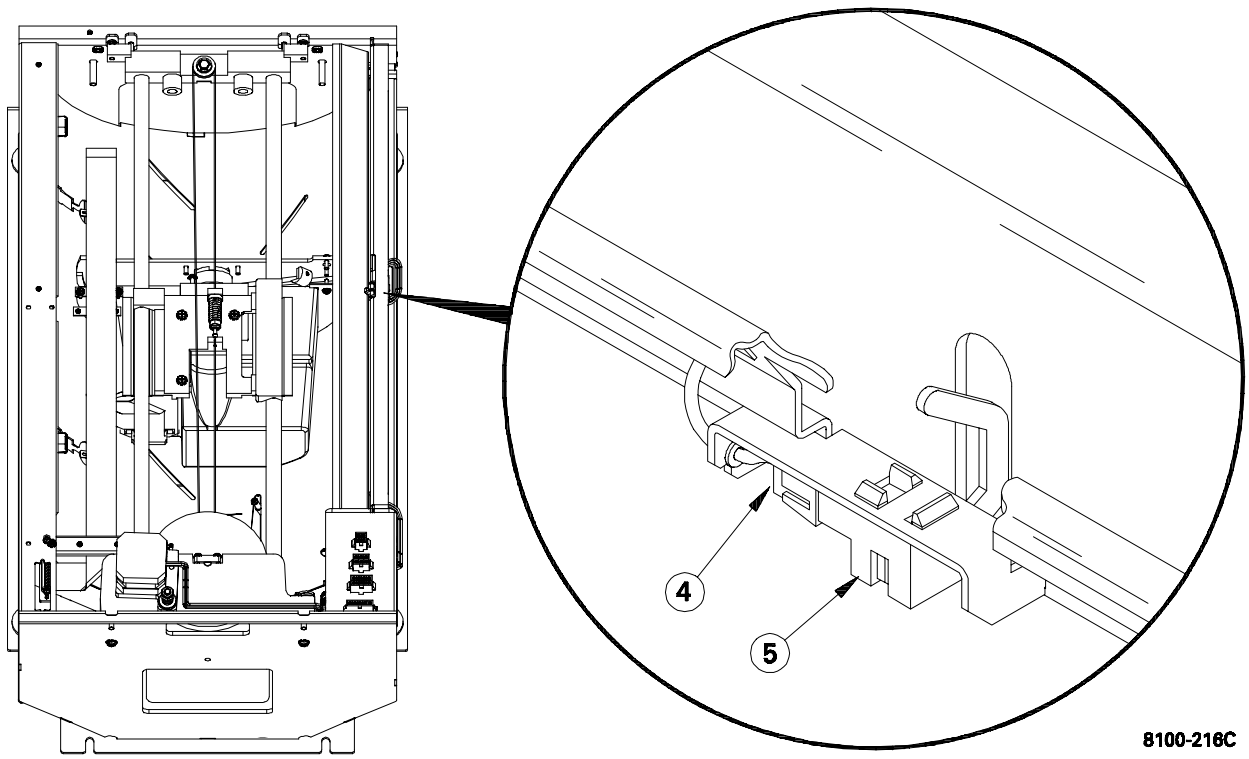


Figure 4-42. Replacing the PLATEN FILM SENSOR (S4)

4-11-4. OPTICS HOME SENSOR (S7)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Remove the ELECTRICAL PLUG from the OPTICS HOME SENSOR (see Figure 4-43).
5. Remove the ATTACHING SCREW and remove the SENSOR.
6. After reassembly, do the Optics Translation Speed and SOP Adjustment, paragraph 3-4.

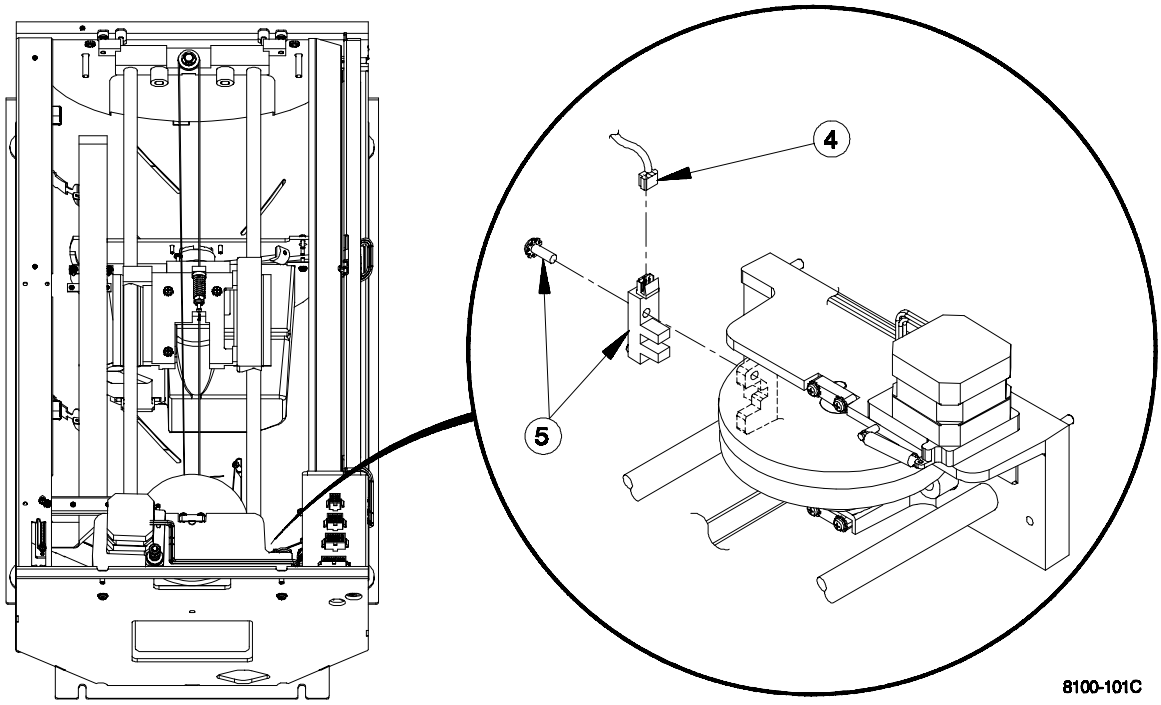


Figure 4-43. Replacing the OPTICS HOME SENSOR (S7)

4-11-5. OPTICS TRANSLATION MOTOR (Step 4) and CAPSTAN

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Do steps 3 through 7 of paragraph 4-11-1 to expose the OPTICS TRANSLATION MOTOR. (It is not necessary to completely remove the IMAGING MODULE from the IMAGER.)
4. Remove the MOTOR CONNECTOR from the CHASSIS (Figure 4-44).
5. Remove 1 nut (M6) and COMPRESSION SPRING.

Note

Remove CABLE TIES as necessary.

6. Remove the MOTOR and CAPSTAN along with the BRACKET ASSEMBLY.

Note

During reassembly, after installing the NUT (M6) and COMPRESSION SPRING, tighten the NUT so it is flush with the end of the BOLT.

7. After reassembly, do the Optics Translation Speed and SOP Delay Adjustment (paragraph 3-4).

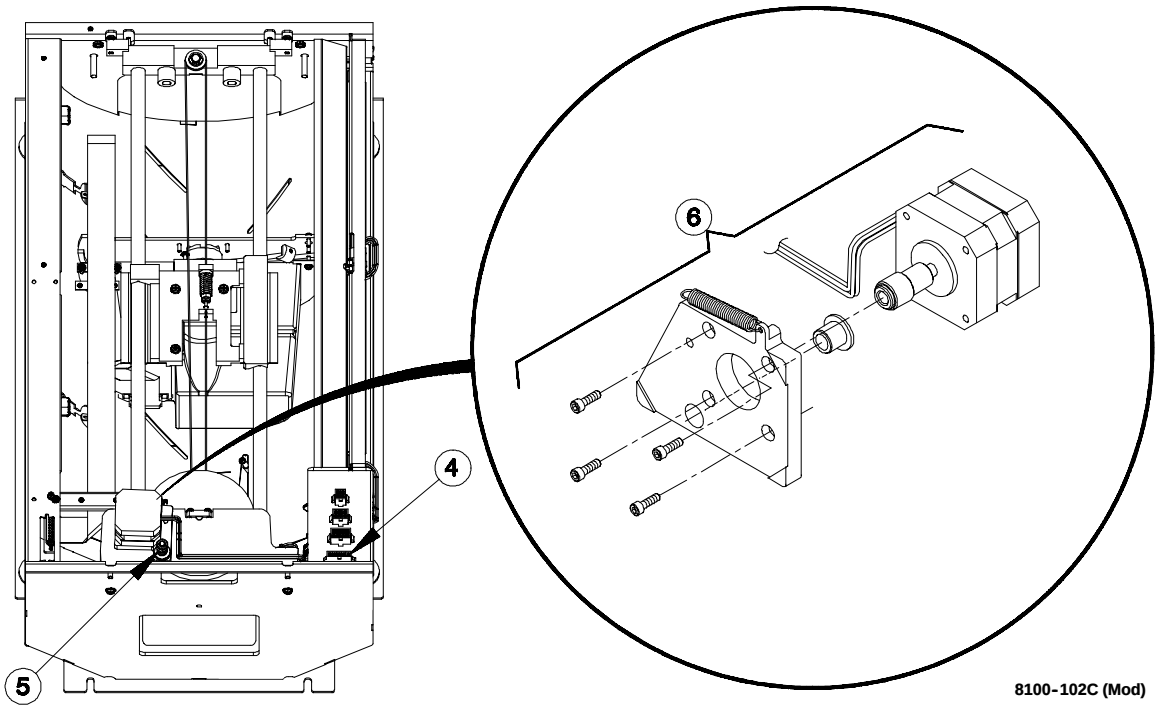


Figure 4-44. Removing the OPTICS TRANSLATION MOTOR and CAPSTAN

4-11-6. FILM CENTERING ASSEMBLY and CENTERING MOTOR (Step 7)

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

1. Remove the SUPPLY CARTRIDGE.
2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the REAR PANEL.
4. Disconnect the MOTOR ELECTRICAL CONNECTOR from the CHASSIS (Figure 4-45).
5. Cut the TIE-WRAP to free the ELECTRICAL CABLE to the MOTOR.
6. Insert a PHILLPS SCREWDRIVER through the small access holes in the end of the IMAGING MODULE and remove 2 SCREWS.
7. Carefully rotate the CENTERING ASSEMBLY and remove it.
8. To remove the CENTERING MOTOR:
   a. Remove the E-RING.
   b. Remove 2 SCREWS to free the MOTOR, SHAFT, and END PLATE.
   c. Remove 2 SCREWS to free the MOTOR from the END PLATE.
   d. Remove the SHAFT from the MOTOR.
9. Reassemble in the reverse order of disassembly.

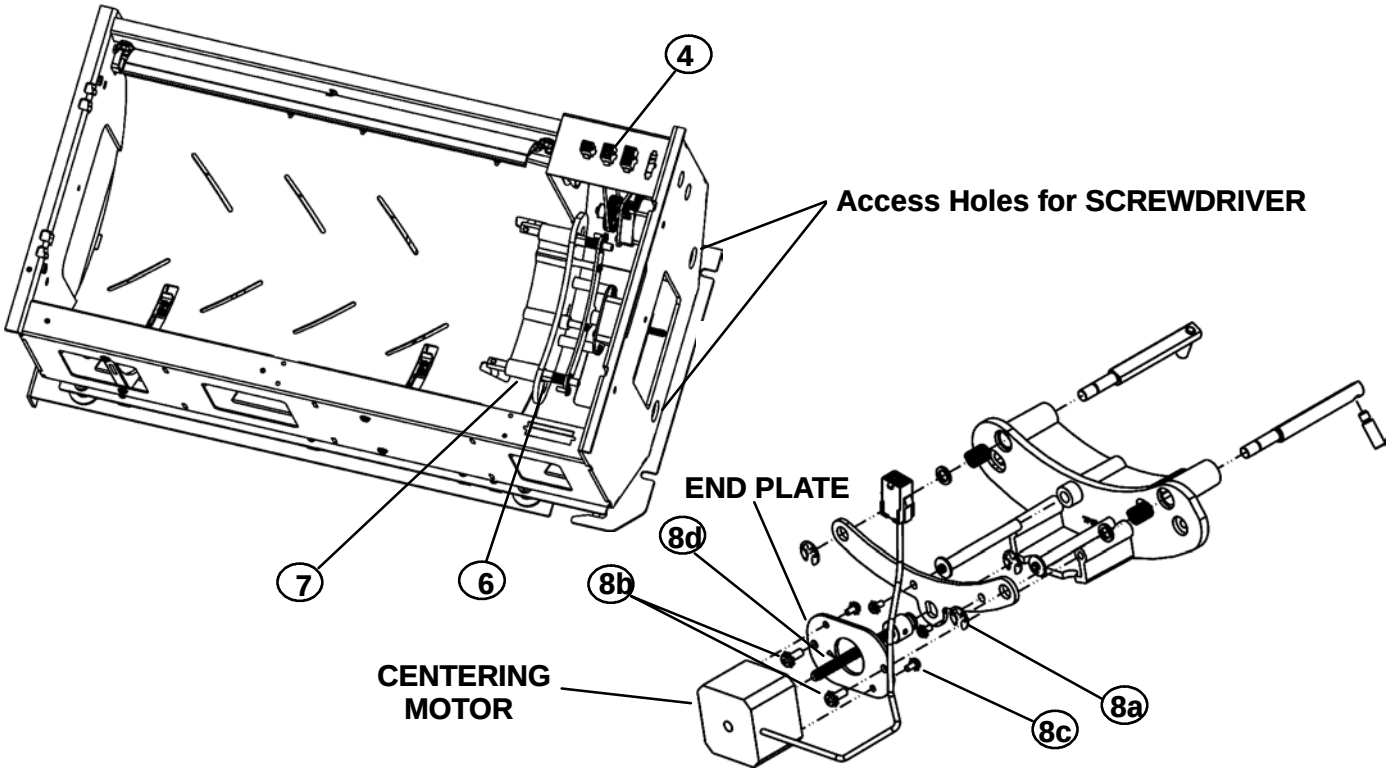


Figure 4-45. Replacing the FILM CENTERING ASSEMBLY and MOTOR

4-11-7. PLATEN ROLLER MOTOR (Step 2)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Disconnect the MOTOR ELECTRICAL CONNECTOR from its slot in the CHASSIS.
5. Remove the 3 SCREWS attaching the MOTOR.
6. Remove the BELT.
7. Remove the MOTOR.

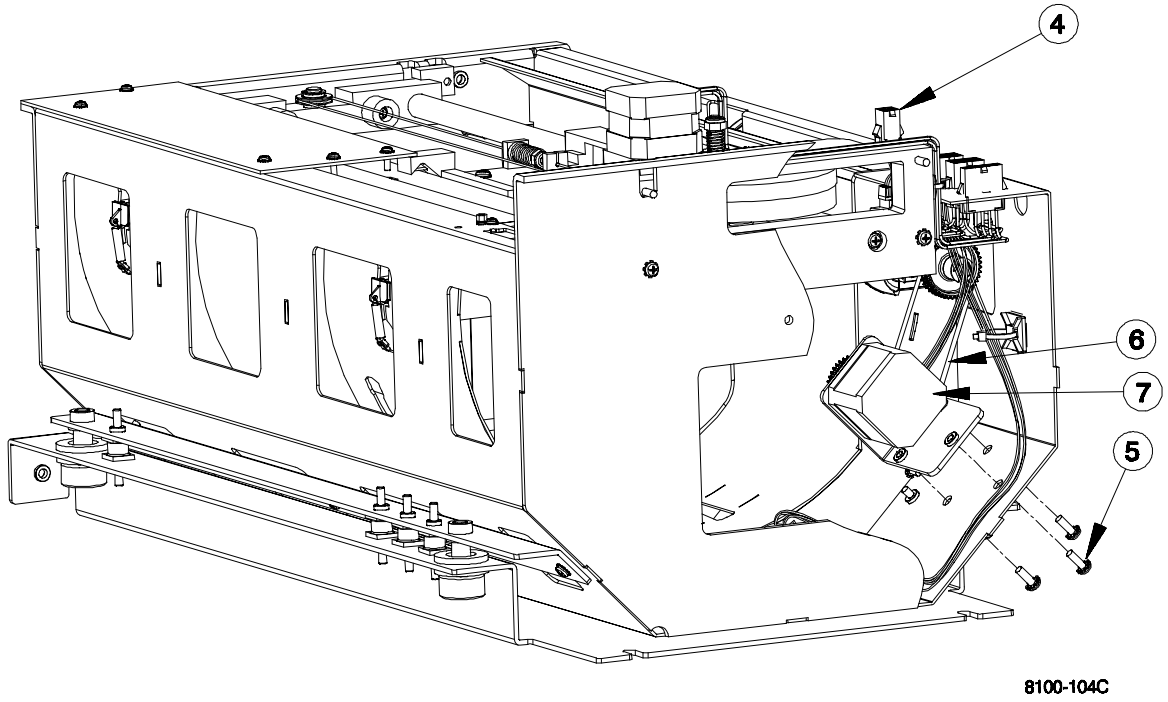


Figure 4-46. Removing the PLATEN ROLLER MOTOR

4-11-8. PLATEN NIP ROLLER BELT

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De–energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Loosen the 3 ATTACHING SCREWS for the PLATEN ROLLER MOTOR.
5. Remove the BELT.

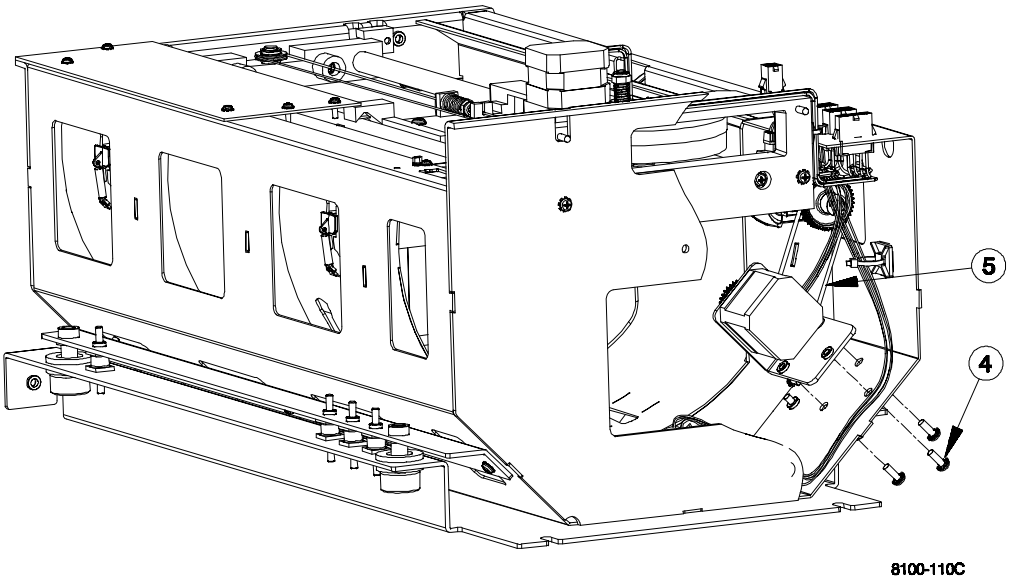


Figure 4-47. Removing the PLATEN NIP ROLLER BELT

4-11-9. PLATEN NIP and DRIVE ROLLERS

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).
4. Remove the NIP ROLLER BELT (paragraph 4-11-8).
5. Remove the following parts at the rear of the IMAGING MODULE:
   a. Remove 2 ATTACHING SCREWS from the outside BEARING BLOCK (see Figure 4-48).
   b. Remove E–RING
   c. Remove BEARING on the end of the DRIVE ROLLER (next to the outside BEARING BLOCK – not visible in Figure 4-48).
   d. Remove SPRING.
   e. Remove outside BEARING BLOCK from the PLATEN CHASSIS.
6. Remove the following parts from the inside end of the DRIVE ROLLER:
   a. E–RING
   b. MAIN SPROCKET
   c. SHAFT PIN
   d. NIP ROLLER DRIVE GEAR
   e. SHAFT PIN
   f. E–RING
   g. BEARING (not shown)
7. Remove the following parts from the inside end of the NIP ROLLER:
   a. E–RING (not shown)
   b. GEAR (not shown)
8. Pull the DRIVE ROLLER NIP ROLLER out from the rear of the PLATEN ASSEMBLY.

   Note: It is not necessary to remove the inside BEARING BLOCK.
9. Remove the E-RING and pull the SPROCKET from the DRIVE ROLLER.

Caution

In reassembly check that the notched surfaces of the BEARING BLOCKS (see inset in Figure 4-48) are pushed in all the way against the IMAGING CYLINDER. The ROLLER set must be pushed in as close to the OPTICS MODULE as possible.

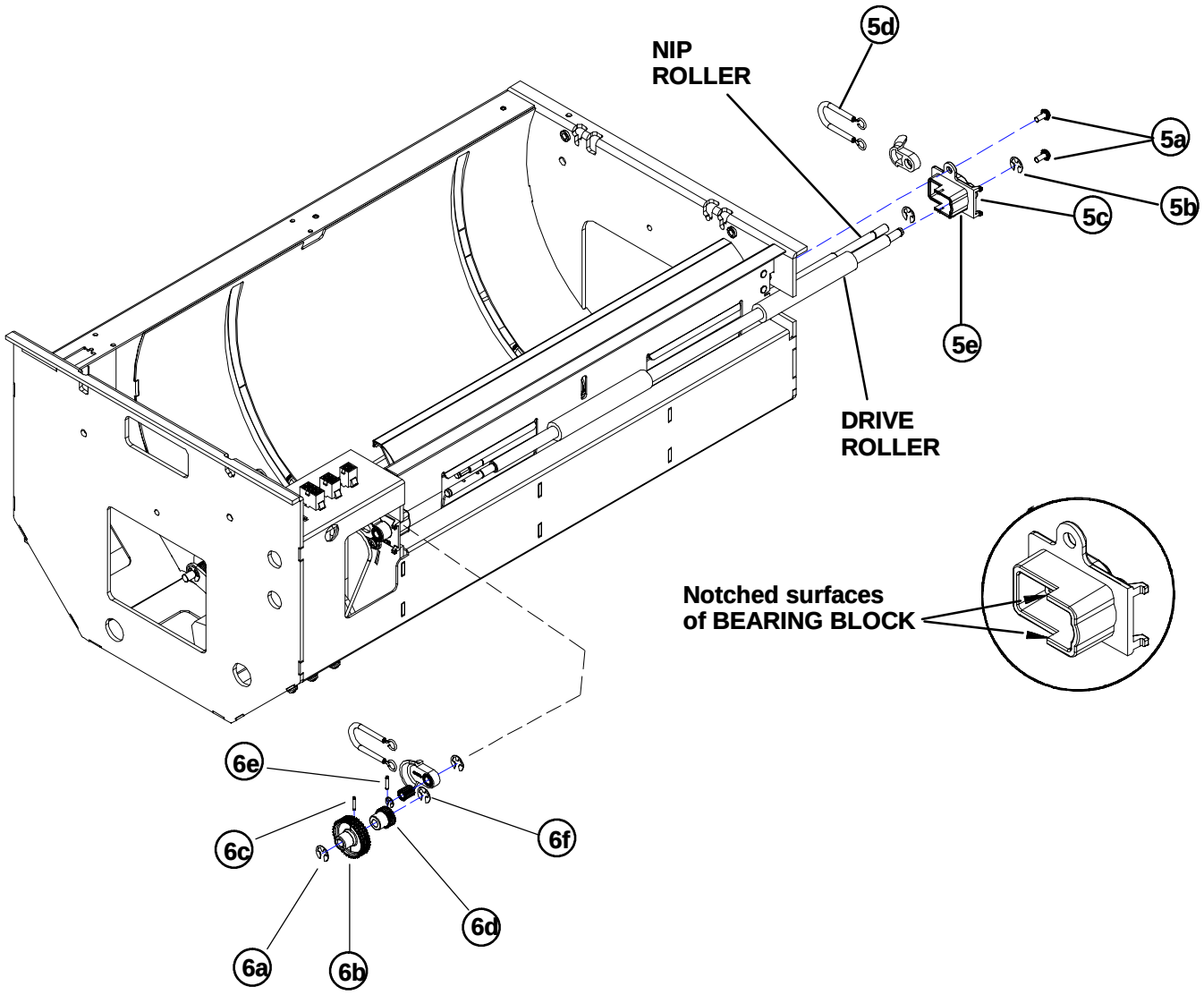


Figure 4-48. Removing the PLATEN ROLLERS

4-11-10. VIBRATION MOUNTS

Preliminary

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the IMAGING MODULE from the IMAGER (4-11-1).

Note

While the IMAGING MODULE is outside the IMAGER, cover the top to avoid introducing dust or debris that may affect image quality.

Disassembly

1. Remove the 8 HEX NUTS (8-32) securing the VIBRATION MOUNTS to the PLATEN SUPPORT ASSEMBLY (see Figure 4-49).
2. Disconnect the GROUND STRAP at one end.
3. Remove the 4 PLATEN SHOULDER SCREWS (M6) from the corners of the PLATEN SUPPORT ASSEMBLY, and remove the PLATEN SUPPORT ASSEMBLY from the PLATEN ASSEMBLY.
4. Unscrew the 8 VIBRATION MOUNTS from the ISOLATOR BRACKETS attached to the PLATEN CHASSIS.

Reassembly

1. Install the 8 replacement VIBRATION MOUNTS into the ISOLATOR BRACKETS. Tighten them so they are snug.
2. Carefully place the PLATEN ASSEMBLY onto the SUPPORT ASSEMBLY while guiding the 8 VIBRATION MOUNTS into the holes of the SUPPORT ASSEMBLY.
3. Install the 4 SHOULDER SCREWS.
4. Secure the PLATEN SUPPORT ASSEMBLY to the VIBRATION MOUNTS with the 8 HEX NUTS.
5. Reattach the GROUND STRAP.

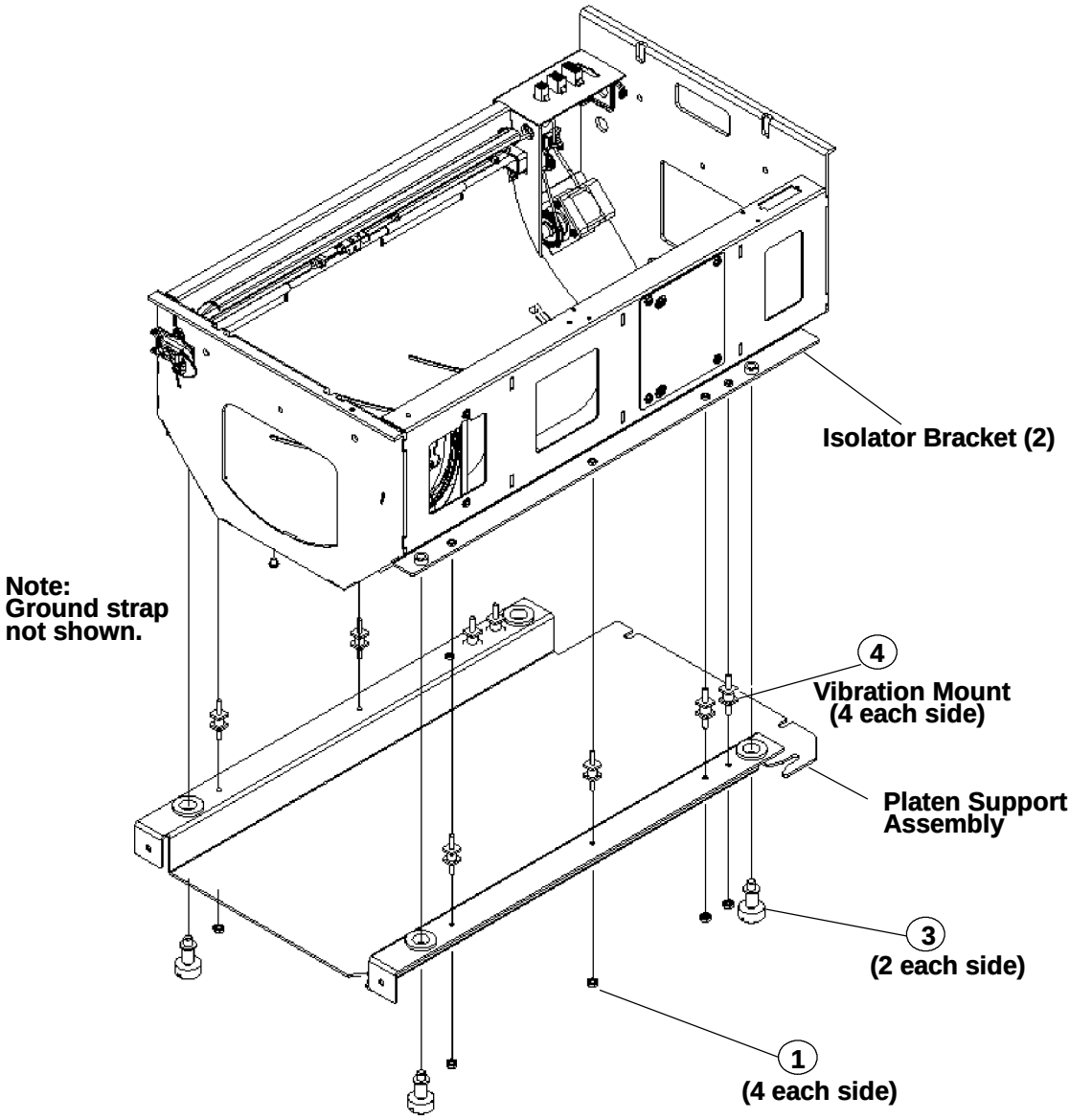


Figure 4-49. Replacing the VIBRATION MOUNTS

4-11-11. OPTICS MODULE

Preliminary

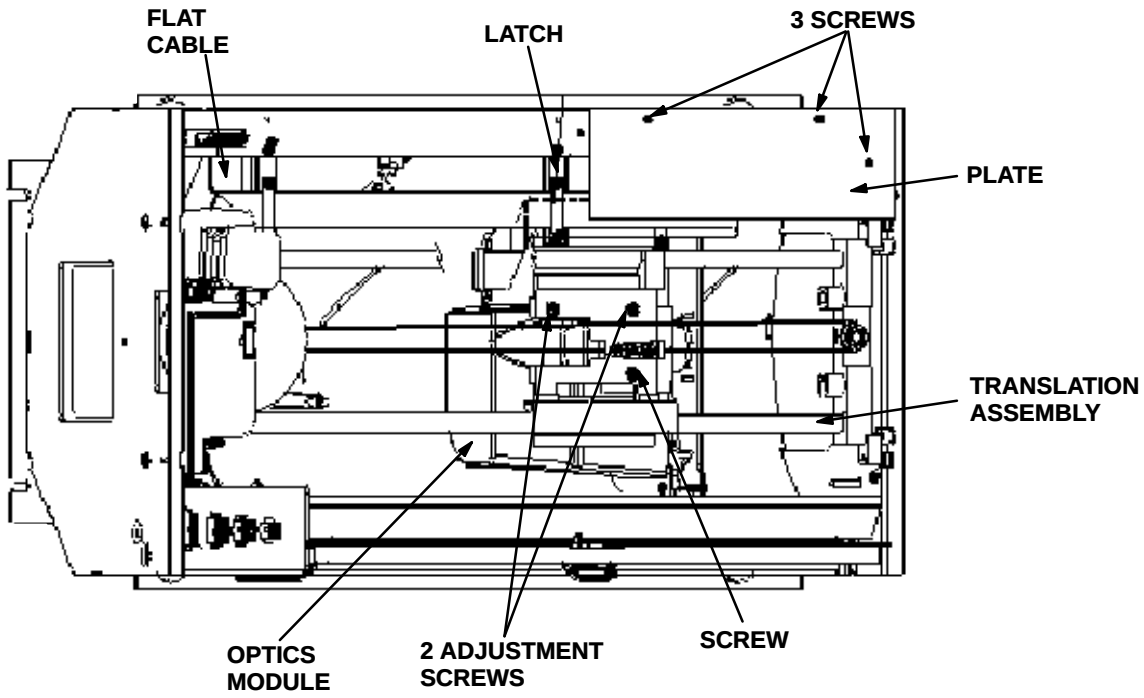
1. Remove the SUPPLY CARTRIDGE.

Warning

Dangerous Voltage

2. De-energize the LASER IMAGER and unplug the POWER CORD.
3. Remove the IMAGING ASSEMBLY. See procedure 4-11-1.

Disassembly



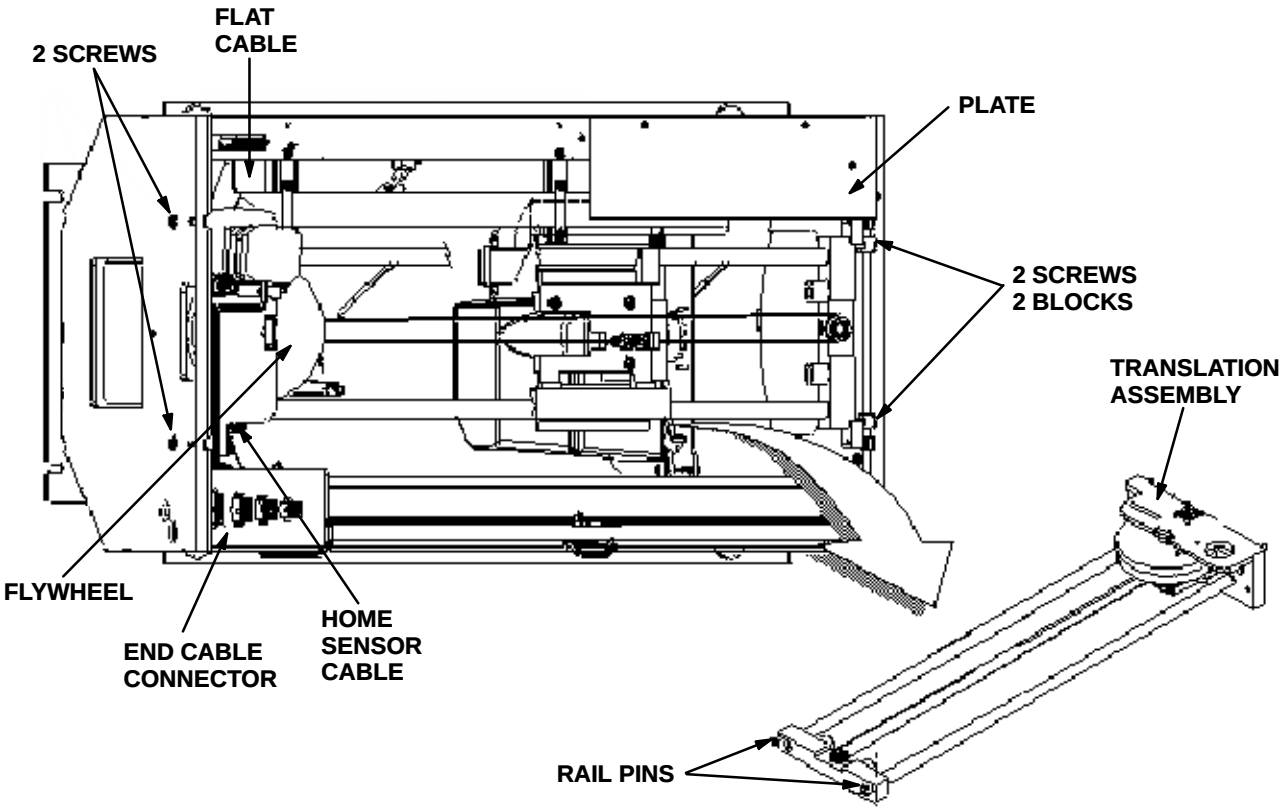
1. Place a sheet of film on the bottom of the IMAGING ASSEMBLY.
2. Disconnect:
   - FLAT CABLE from OPTICS MODULE
   - LATCH
3. Hold the OPTICS MODULE with 1 hand and remove:
   - 2 ADJUSTMENT SCREWS
   - SCREW

Note

If a WASHER is used with 1 of the SCREWS, note the position for installation.

4. Lower the OPTICS MODULE to the bottom of the IMAGING ASSEMBLY.

5. Remove:
   - 3 SCREWS
   - PLATE



IMAGING ASSEMBLY

Note

Do not disconnect the FLAT CABLE.

6. Lift the PLATE and FLAT CABLE outside of the IMAGING ASSEMBLY.
7. Remove:
   - 2 SCREWS from the end of the IMAGING ASSEMBLY by the FLYWHEEL
   - 2 SCREWS from the other end of the IMAGING ASSEMBLY
   - 2 BLOCKS

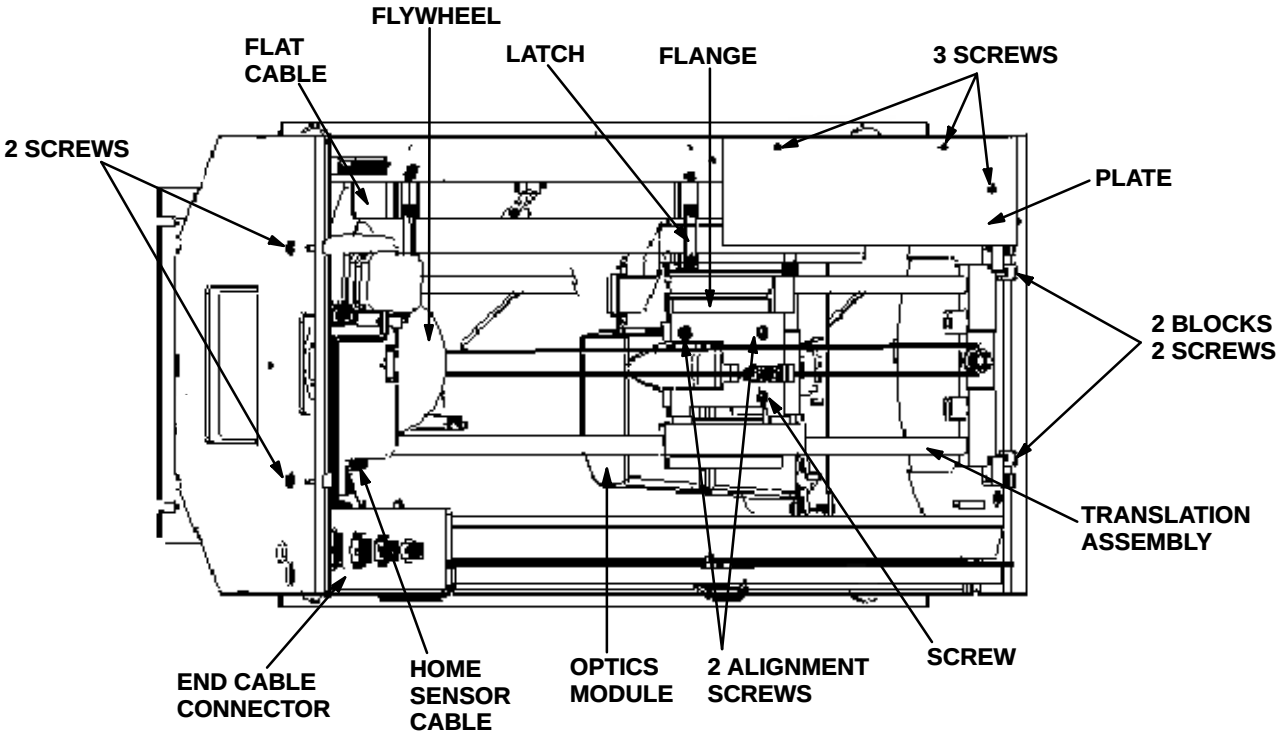
Note

Keep the HOME SENSOR CABLE with the IMAGING ASSEMBLY.

8. Disconnect:
   - END CABLE CONNECTOR
   - HOME SENSOR CABLE
9. Lift the TRANSLATION ASSEMBLY from the IMAGING ASSEMBLY and set it down.
10. Remove the OPTICS MODULE.

Reassembly

1. Place the new OPTICS MODULE in the IMAGING ASSEMBLY.
2. Install the TRANSLATION ASSEMBLY:
   - Seat the RAIL PINS in the end of the IMAGING ASSEMBLY.
   - Hold the RAIL PINS in position when you do Step 3.

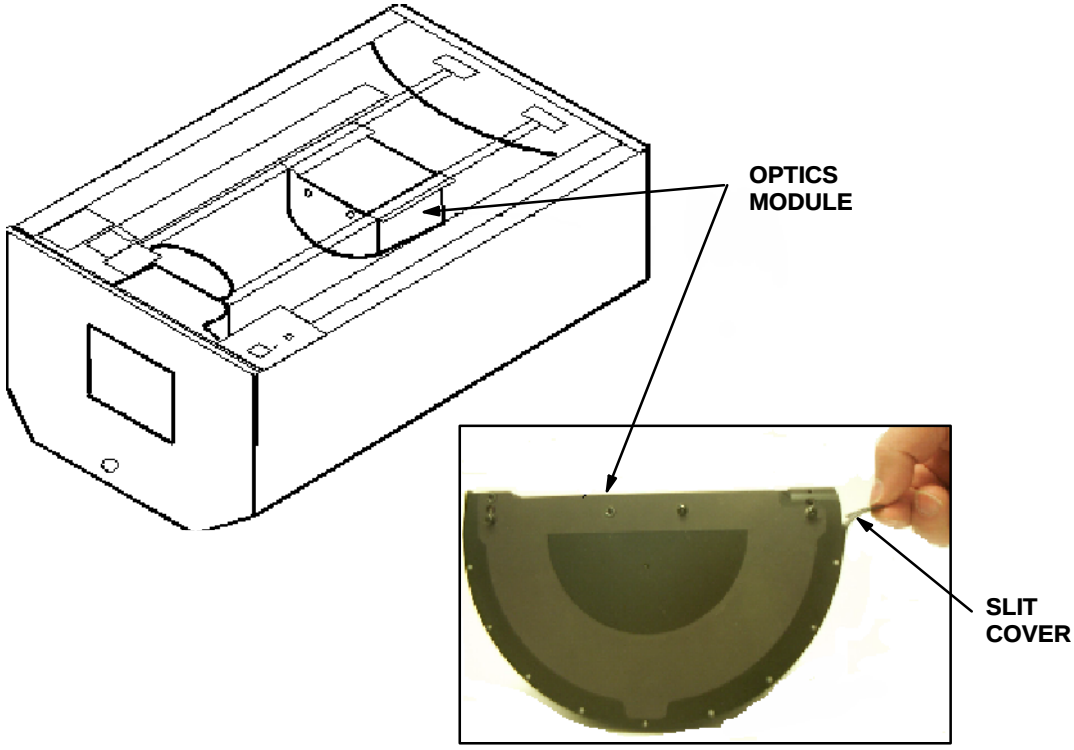


3. Install:
   - 2 SCREWS on the end by the FLYWHEEL
   - 2 BLOCKS
   - 2 SCREWS
4. Lift the OPTICS MODULE into position on the TRANSLATION ASSEMBLY.
5. Hold the OPTICS MODULE against the FLANGE and install:
   - WASHER from Step 3 of **Disassembly**, if necessary
   - 2 ALIGNMENT SCREWS
   - SCREW
   - END CABLE CONNECTOR
   - HOME SENSOR CABLE
   - PLATE
   - 3 SCREWS
   - LATCH

Caution

ISOPROPYL ALCOHOL is highly flammable. Follow the manufacturer's instructions for safe use and handling.

6. Use ISOPROPYL ALCOHOL and a LINT-FREE CLOTH to clean:
   - RAILS on the TRANSLATION ASSEMBLY
   - DRIVE surface of the FLYWHEEL
7. Remove the film from the bottom of the IMAGING ASSEMBLY.
8. Install the IMAGING ASSEMBLY. See procedure 4-11-1.
9. Move the TRANSLATION ASSEMBLY to the front of the IMAGER.
10. From the front of the IMAGER, open the COVER of the IMAGER ASSEMBLY.



11. Remove the SLIT COVER from the new OPTICS MODULE. Check that double back tape is still attached to slit cover.
12. Install the SLIT COVER on the old OPTICS MODULE for shipment.

Checkout

1. Install a SUPPLY CARTRIDGE and energize the LASER IMAGER.
2. Make a print of a "flat-field inspection" film.
3. Check for horizontal banding.
4. If horizontal banding occurs, clean LENS L3. See procedure 5-5.
5. Make a print of a "clinical" image and check for artifacts.
6. Check the quality of the clinical image with the customer.

7. Troubleshoot image problems if necessary. See Section 7.

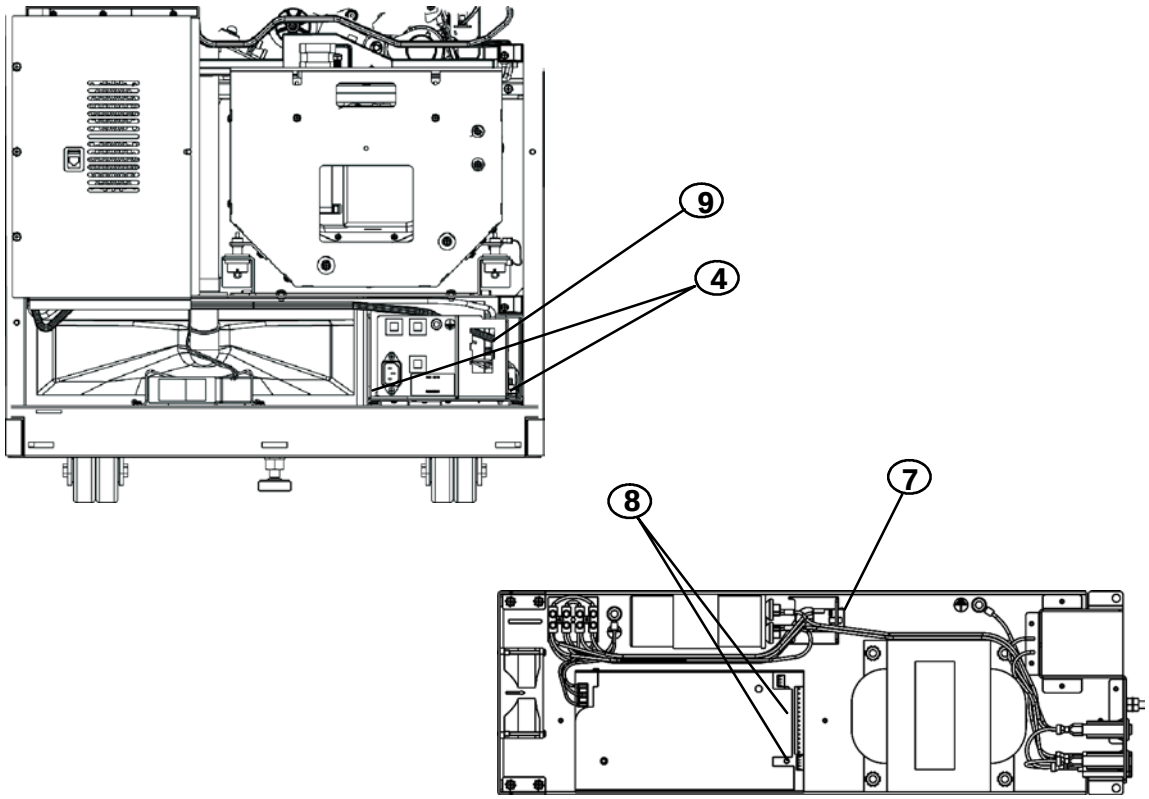
4-12. POWER ASSEMBLY

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the REAR PANEL.
4. Remove the 2 ATTACHING SCREWS from the POWER SUPPLY BASE (Figure 4-50).
5. Open the FRONT DOOR and remove 2 ATTACHING SCREWS from the other end of the POWER SUPPLY.
6. Pull the POWER SUPPLY out the back of the IMAGER far enough to expose the CABLE connections at the center of the ASSEMBLY.
7. Disconnect the AC POWER CABLE (Figure 4-50).
8. Disconnect the 2 DC CABLE CONNECTORS from the POWER SUPPLY BOARD.
9. Carefully pull the POWER SUPPLY from the IMAGER.
10. If you are installing a new POWER ASSEMBLY, remove the VOLTAGE SELECTION PLUG and install it in the new ASSEMBLY.



Top View of POWER ASSEMBLY

Figure 4-50. Removing the POWER ASSEMBLY

4-13. MCS ELECTRONIC COMPONENTS

This procedure removes the INTERLOCKS, CIRCUIT BOARDS, SERVICE OVERRIDE SWITCH, etc.

Caution

To avoid damage to sensitive ELECTRONIC COMPONENTS, always wear an ANTI-STATIC WRIST STRAP when handling CIRCUIT BOARDS. CIRCUIT BOARDS contain lead and replaced BOARDS must be returned to Kodak for rework, or disposed of properly.

Preliminary

Do the Preliminary procedure before doing any disassembly procedures.

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De−energize the IMAGER and disconnect the POWER CORD.

POWER SWITCH (Figure 4-51, Front View)

1. Lift the TOP HOOD.
2. Loosen 2 7−mm NUTS attaching the COVER for the TOP HOOD INTERLOCK and POWER SWITCH.
3. Slip down the COVER (slotted) to expose the POWER SWITCH.
4. Disconnect the WIRES and remove the POWER SWITCH.

TOP HOOD INTERLOCK (see Figure 4-51, Front View)

1. Lift the TOP HOOD.
2. Loosen 2 7−mm NUTS attaching the COVER for the TOP HOOD INTERLOCK and POWER SWITCH.
3. Slip down the COVER (slotted) to expose the INTERLOCK.
4. Remove 2 ATTACHING SCREWS and disconnect the WIRES to free the INTERLOCK.

FRONT DOOR INTERLOCK Switch (Figure 4-51, Front View)

1. Open the FRONT DOOR and remove the REAR PANEL.
2. Loosen the 4 SCREWS (2 each end) securing the IMAGING MODULE, and slide the MODULE out the back of the IMAGER about 6 inches.
3. Open the PLATEN door from the front of the IMAGER.
4. Reach in through the PLATEN doorway to remove 2 SCREWS securing the INTERLOCK switch. Then disconnect the ELECTRICAL PLUG to remove the SWITCH. Do not remove the whole INTERLOCK ASSEMBLY.

DOOR RELEASE SOLENOID (Figure 4-51, Front View)

1. Open the FRONT DOOR.
2. Remove 4 SCREWS and disconnect the ELECTRICAL PLUG to remove the SOLENOID.

REAR PANEL INTERLOCK (Figure 4-51, Rear View)

1. Remove the REAR PANEL.

2. Remove the COVER BOX for the PROCESSOR INTERFACE BOARD (1 PLUG and 4 SCREWS).
3. Remove 4 SCREWS and disconnect the WIRES to free the INTERLOCK.

MCS BOARD (Figure 4-51, Rear View)

1. Remove the REAR PANEL and disconnect all ELECTRICAL PLUGS from the BOARD.
2. Remove 8 ATTACHING SCREWS and remove the BOARD.
3. Make sure that JUMPER JP1 in the upper, right area of the BOARD is in the Normal position, on the left 2 pins (see Figure 3-3 in Adjustments).
4. After installing a new BOARD, do the PROCESSOR DRUM Temperature Adjustment (paragraph 3-1) and the LASER Dynamic Range Adjustment (paragraph 3-6).

FEEDER BOARD (Figure 4-51, Rear View)

1. Remove the REAR PANEL and disconnect all ELECTRICAL PLUGS from the BOARD.
2. Remove 4 ATTACHING SCREWS and remove the BOARD.

SERVICE (OVERRIDE) SWITCH (Figure 4-51, Rear View)

1. Remove the REAR PANEL.
2. Remove the SWITCH ACTUATOR SCREW from the PROCESSOR INTERFACE BOARD (PIB) COVER BOX. Then remove the PIB COVER BOX (1 plug and 4 SCREWS).
3. Squeeze together the CLIPS on the base of the SWITCH to disconnect it from its MOUNTING BRACKET.
4. Remove the WIRES from the SWITCH TERMINALS to free the SWITCH.
5. Replace the SWITCH and reconnect the WIRES.
6. Replace and secure the PIB COVER BOX (4 SCREWS and 1 ELECTRICAL PLUG).
7. Energize the IMAGER.
8. Lift the UPPER HOOD and check that the PROCESSOR MOTOR is operating. (SERVICE OVERRIDE SWITCH is in “service” position, defeating the TOP HOOD INTERLOCK.)
9. Insert the actuator SCREW in the COVER BOX and lower it to the “user” position. (The PROCESSOR MOTOR should stop turning.)

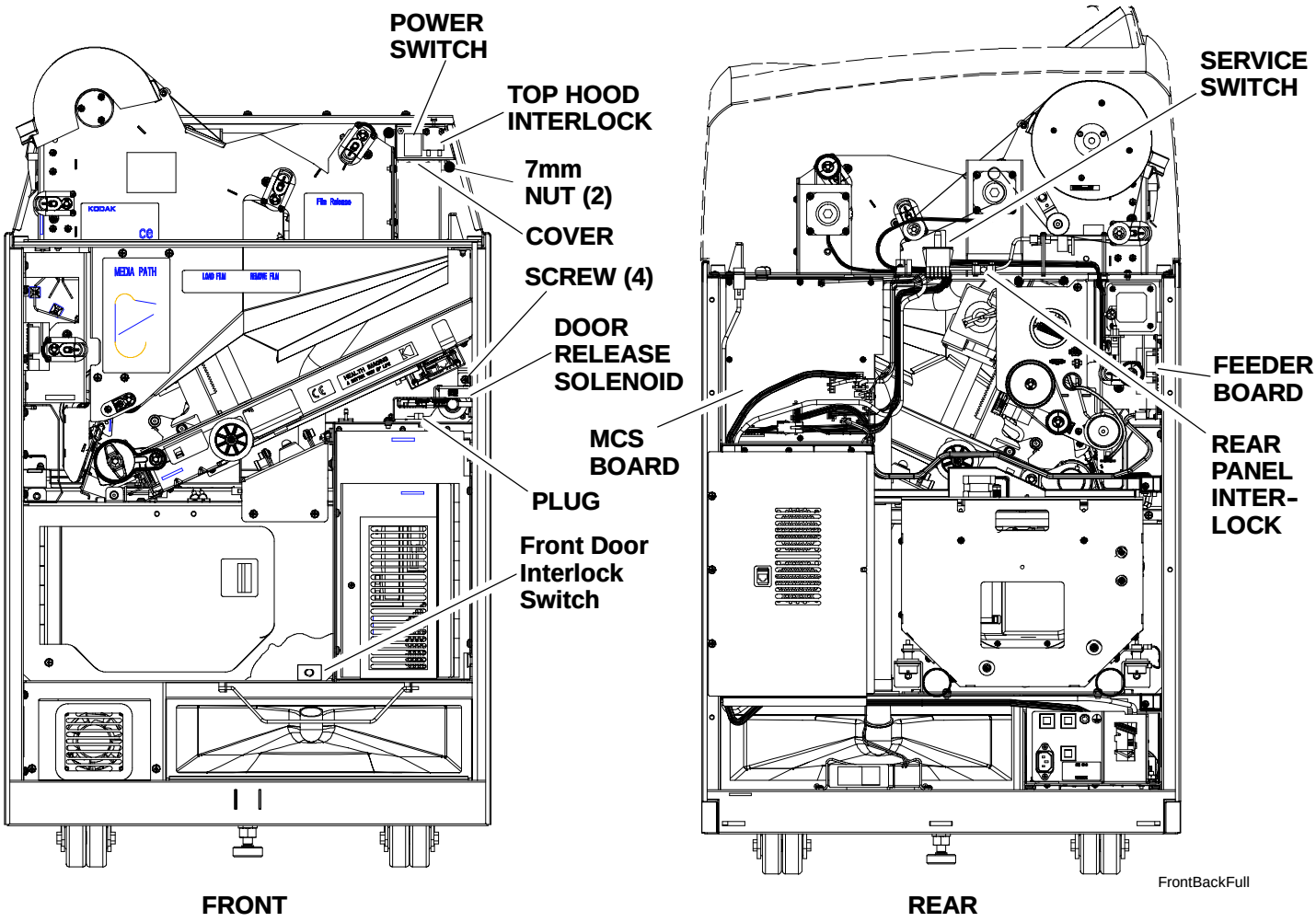


Figure 4-51. Replacing ELECTRONIC COMPONENTS

4-14. DICOM RASTER ENGINE (DRE) COMPUTER

Caution

The DRE COMPUTER includes a LITHIUM BATTERY. This type of BATTERY requires proper disposal and cannot be discarded with ordinary trash. The DRE COMPUTER is a controlled part and if it is replaced, it must be returned to Kodak for rework. CIRCUIT BOARDS contain lead. Any BOARD that is replaced must be returned to Kodak or disposed of properly.

Note

If you replace the DRE COMPUTER with a new (preprogrammed) COMPUTER, you must download the configuration files from the HARD DRIVE to a FLOPPY DISK before removing the old DRE. This is because a new HARD DRIVE will be installed with the DRE, and will require the configuration files from the old DRIVE, which are unique to this site. See the Configuration Backup procedure 7-2-18 in Troubleshooting. If you cannot download from the old DRE HARD DRIVE, you will have to use the configuration FLOPPY DISK, that should be stored in the IMAGER, to restore the configuration to the new DRE HARD DRIVE.

Disassembly

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Disconnect the NETWORK CABLE from the back of the IMAGER.
4. Remove the REAR PANEL.
5. Disconnect the *Ethernet* CONNECTOR from the COVER PLATE for the DRE COMPUTER and push it inside the COVER PLATE.
6. Remove 4 SCREWS.
7. Remove the COVER PLATE.

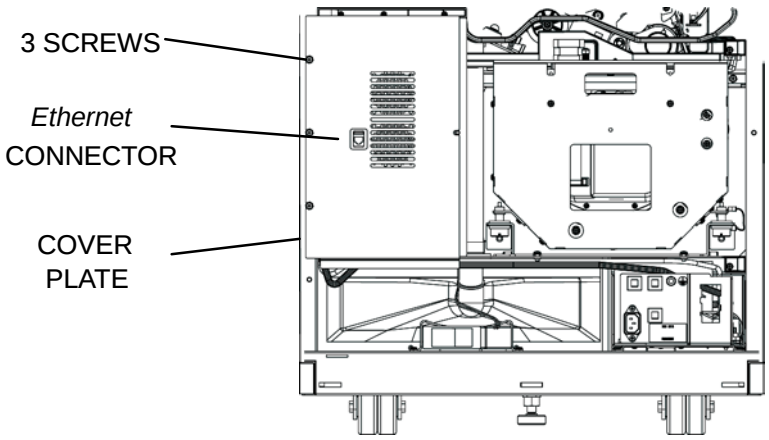


Figure 4-52. Gaining Access to the DRE COMPUTER

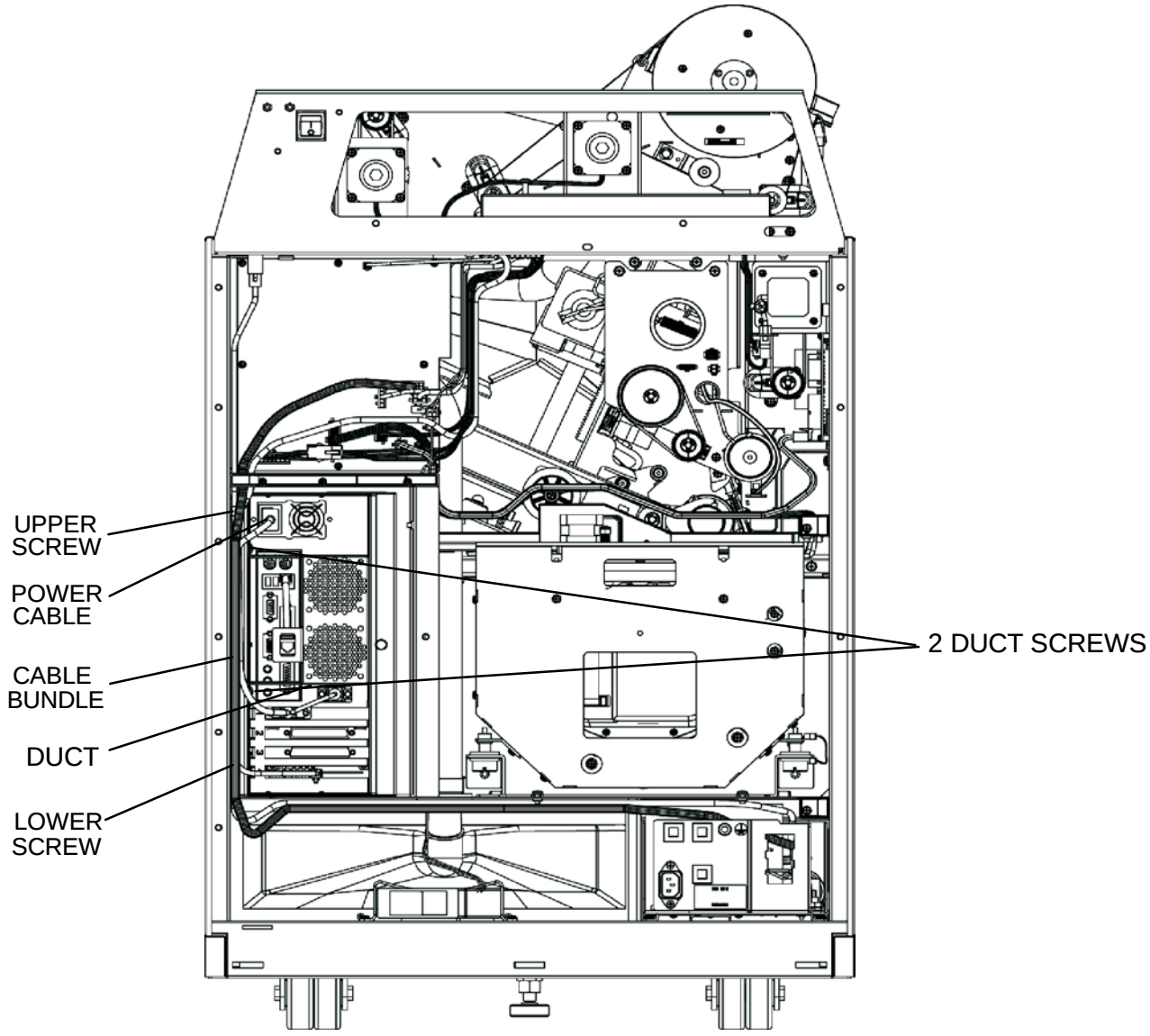


Figure 4-53. Gaining Access to the CABLES

8. Remove UPPER and LOWER SCREWS.
9. Disconnect the POWER CABLE.
10. Pull the DRE COMPUTER forward slightly, then move it to the right to avoid the CABLE BUNDLE.
11. Pull the DRE COMPUTER forward far enough to access the SCREWS fastening the DUCT.
12. Remove the 2 DUCT SCREWS.
13. Remove the DUCT.

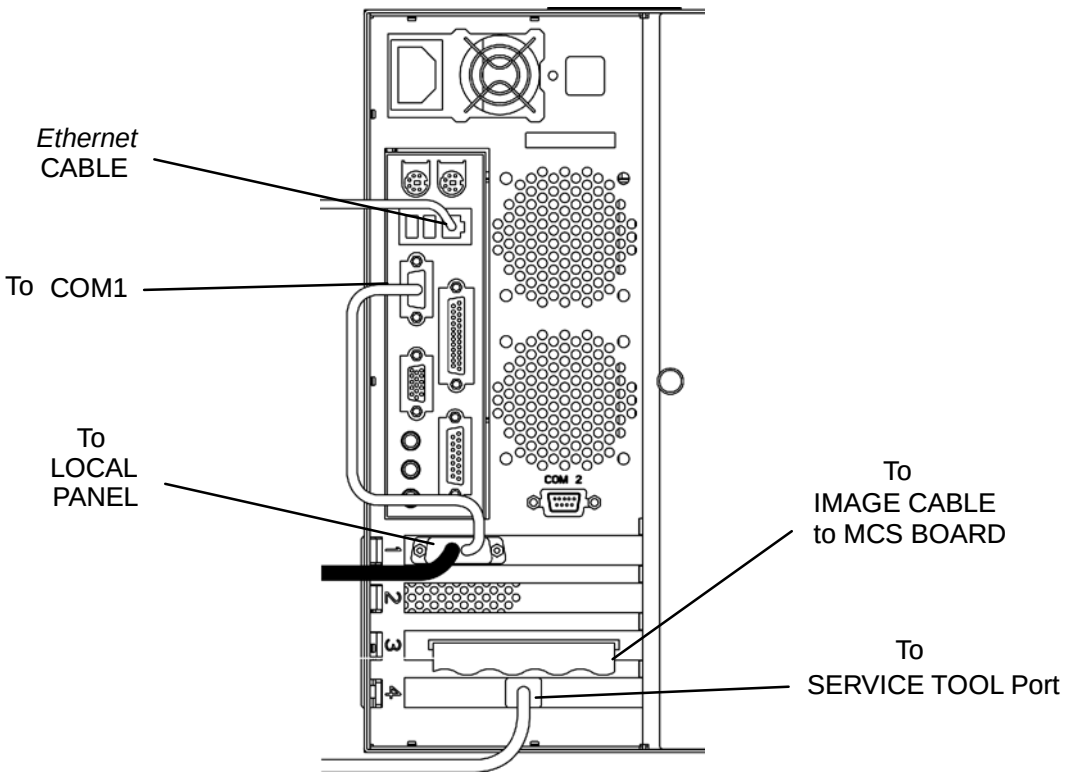


Figure 4-54. Removing the DRE COMPUTER

14. Disconnect:
    - *Ethernet* CABLE
    - CABLE to SERVICE TOOL Port
    - IMAGE CABLE to MCS BOARD
    - CABLE to LOCAL PANEL
    - COM1 CABLE to end of LOCAL PANEL CABLE

Caution

Avoid damage to the CABLE BUNDLE when removing the DRE COMPUTER.

15. Carefully pull the DRE COMPUTER all the way out of the IMAGER.

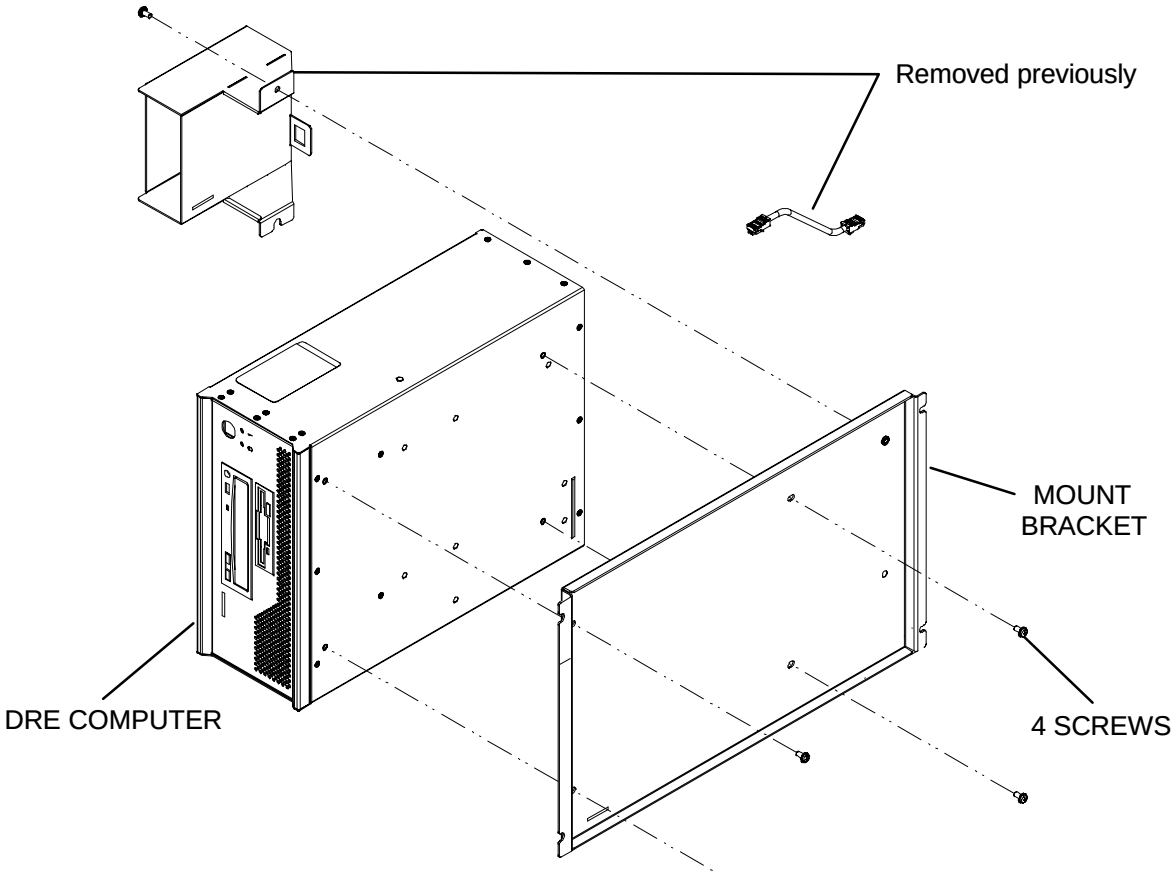


Figure 4-55. Removing the MOUNTING BRACKET

16. Remove 4 SCREWS.
17. Remove the MOUNTING BRACKET.
18. Set the DRE COMPUTER on its BASE.
19. If you are going to service the DRE COMPUTER:
    a. Loosen the CAPTIVE SCREW fastening the COVER.
    b. Remove the COVER.

Reassembly

1. Reassemble in reverse order of disassembly.
2. If you installed a new DRE COMPUTER, energize the IMAGER and check the version of DRE software via the LOCAL PANEL.
3. If the software is not up to date, ghost the current version of software onto the HARD DRIVE. (See procedure 7-2-20 in Section 7.
4. After ghosting, upload the system configuration file from the backup FLOPPY DISK to the HARD DRIVE.

4-14-1. DRE HARD DRIVE, CD-ROM DRIVE, or FLOPPY DRIVE

Preliminary Disassembly

Note

If you are going to install a new HARD DRIVE, back up the system configuration to a FLOPPY DISKETTE in your LAPTOP COMPUTER before proceeding. (See procedure 7-2-18 in Troubleshooting.)

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the DRE COMPUTER from the IMAGER and remove the COVER of the COMPUTER (see procedure 4-14).

Removing the HARD DRIVE

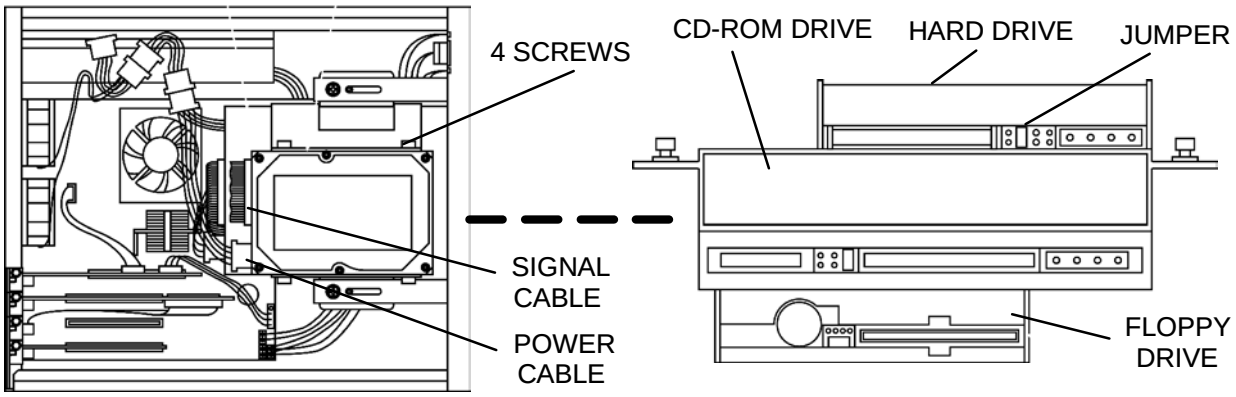


Figure 4-56. Removing the HARD DRIVE

4. Disconnect the POWER CABLE.
5. Disconnect the SIGNAL CABLE.
6. LOOSEN 4 spring-loaded SCREWS.
7. Remove the HARD DRIVE.
8. Check that the JUMPER on the new HARD DRIVE is set at the “Cable Select” position.
9. Assembly is the reverse of disassembly. When installing the 4 SCREWS, lift the HARD DRIVE slightly to align the SCREWS with the holes in the DRIVE.
10. After installing a new HARD DRIVE and completing reassembly. Energize the IMAGER and check the version of software on the DRIVE via the LOCAL PANEL.
11. If the software is not up to date, load (re–ghost) the current version of software onto the HARD DRIVE. (See procedure 7-2-20 in Troubleshooting.)

12. After ghosting, upload the system configuration file from FLOPPY DRIVE to the HARD DRIVE.

Removing the CD-ROM Drive

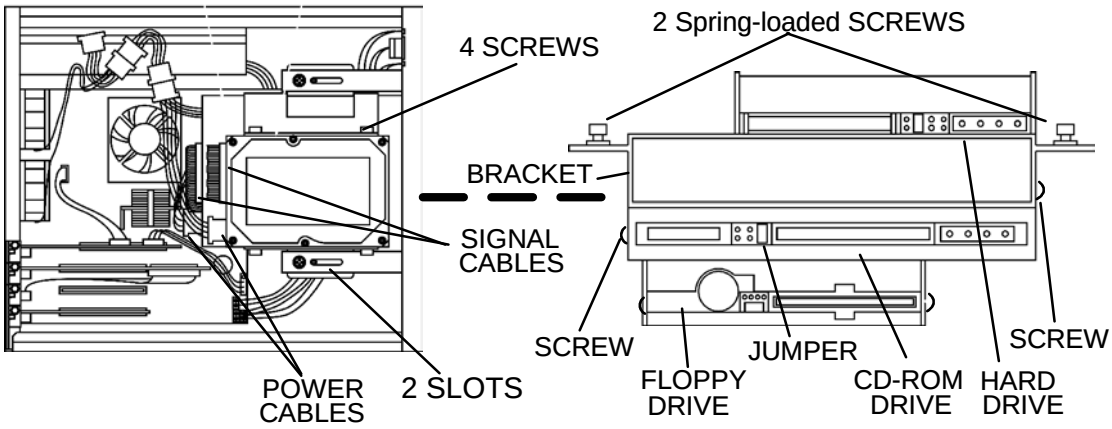


Figure 4-57. Removing the CD-ROM DRIVE

1. Disconnect the POWER CABLE and SIGNAL CABLE from the HARD DRIVE (see Figure 4-55).
2. Disconnect the POWER CABLE from the CD-ROM DRIVE.
3. Loosen 2 spring-loaded SCREWS.

Caution

Take care not to damage CONNECTORS of the CABLES that are still attached during the removal.

4. Slide the assembly of the 3 DRIVES slightly back from the front of the COMPUTER and carefully lift to remove the assembly with CABLES still attached to the CD-ROM DRIVE and FLOPPY DRIVE.
5. Disconnect the SIGNAL CABLE from the CD-ROM DRIVE.
6. Remove 2 SCREWS fastening the CD-ROM DRIVE to the BRACKET.
7. Slide the CD-ROM DRIVE out of the BRACKET.
8. Check that the JUMPER on the new CD-ROM DRIVE is set at the “MASTER” position.

Note

Fold CABLES neatly under the DRIVES during reassembly.

9. Install the new DRIVE in reverse order of the disassembly procedure.

4-14-2. Removing the FLOPPY DRIVE

1. Repeat steps 1 through 5 of “Removing the CD-ROM DRIVE”.
2. Disconnect the POWER CABLE and SIGNAL CABLE from the FLOPPY DRIVE.
3. Remove 2 SCREWS fastening the FLOPPY DRIVE to the BRACKET.
4. Slide the FLOPPY DRIVE out of the BRACKET.

Note

Fold CABLES neatly under the DRIVES during reassembly.

5. Install a new DRIVE in reverse order of the disassembly procedure.

4-14-3. Removing the PCIO BOARD, *Ethernet* BOARD, or LOCAL PANEL TRANSMITTER BOARD

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the DRE COMPUTER from the IMAGER and remove the COVER of the COMPUTER (see procedure 4-14).

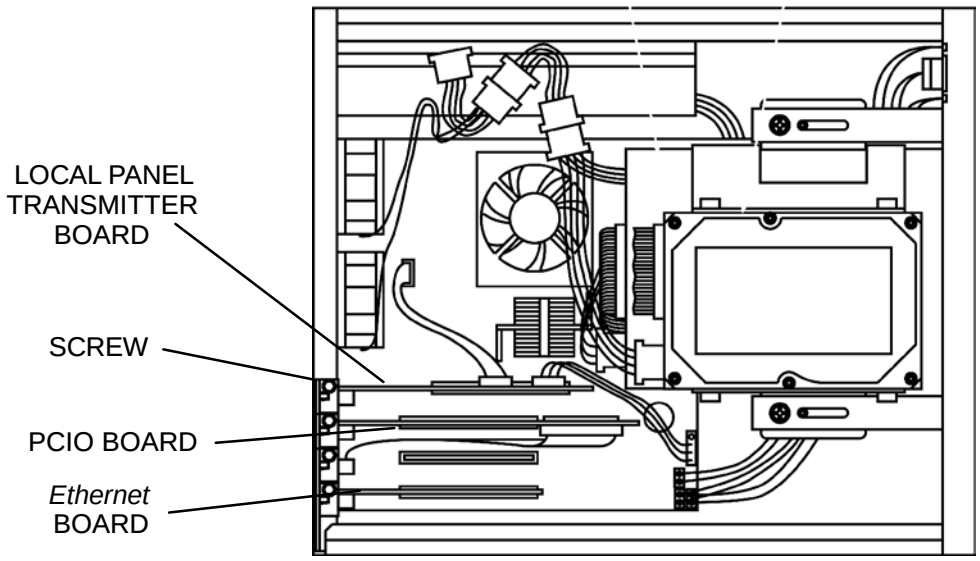


Figure 4-58. Removing CIRCUIT BOARDS

Caution

- Wear a WRIST STRAP when handling CIRCUITS BOARDS.
- CIRCUIT BOARDS contain lead. Any BOARD that is replaced must be returned to Kodak or disposed of properly.

4. For any of the 3 CIRCUIT BOARDS:
   a. Disconnect CABLES from the CIRCUIT BOARD (if any).
   b. Remove 1 SCREW.
   c. Pull the CIRCUIT BOARD straight up from its SOCKET.
5. Install the new CIRCUIT BOARD in reverse order of disassembly.

4-14-4. Removing the DIMM MEMORY BOARDS

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the DRE COMPUTER from the IMAGER and remove the COVER of the COMPUTER (see procedure 4-14).
4. Remove the assembly of 3 DRIVES (see procedure 4-14-1).

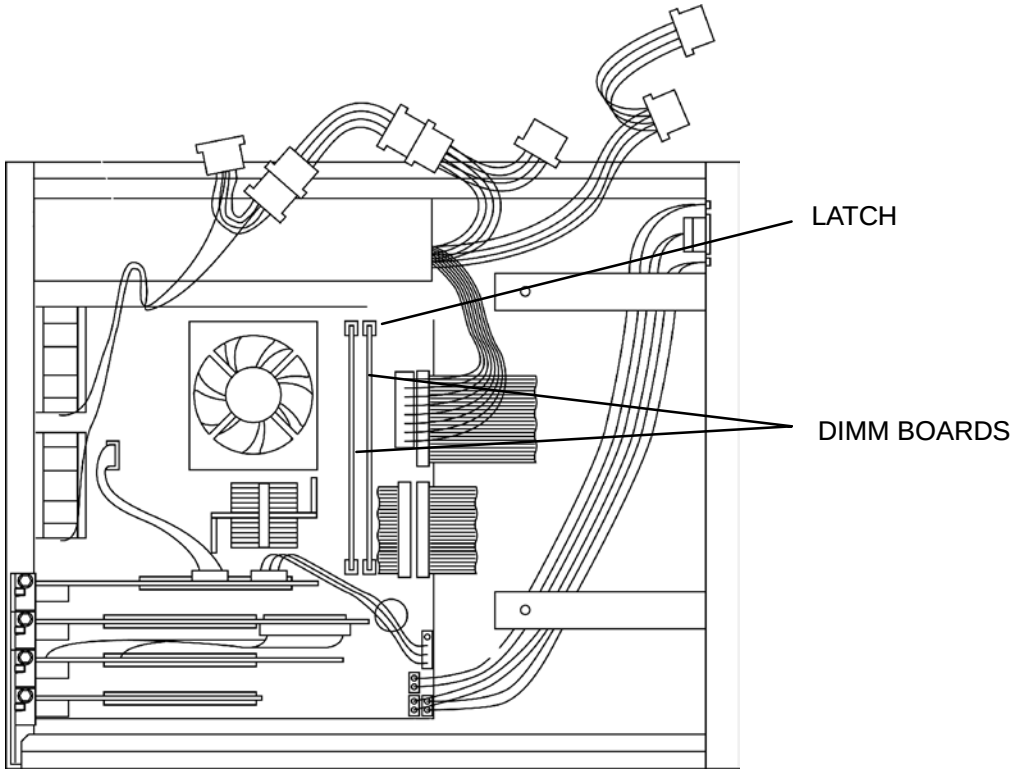


Figure 4-59. Removing the DIMM BOARDS

Caution

- Wear a WRIST STRAP when handling CIRCUITS BOARDS.
- CIRCUIT BOARDS contain lead. Any BOARD that is replaced must be returned to Kodak or disposed of properly.

5. Release the 2 LATCHES for each BOARD.
6. Remove the DIMM BOARDS.
7. Assemble in the reverse order of disassembly.

4-14-5. Removing the DRE POWER SUPPLY

1. Remove the SUPPLY CARTRIDGE.

Warning

When the POWER CORD is plugged in, hazardous voltages are present in some areas of the IMAGER. These voltages can cause severe injury or death.

2. De-energize the IMAGER and disconnect the POWER CORD.
3. Remove the DRE COMPUTER from the IMAGER and remove the COVER of the COMPUTER (see procedure 4-14).
4. Remove the assembly of 3 DRIVES (see procedure 4-14-1).

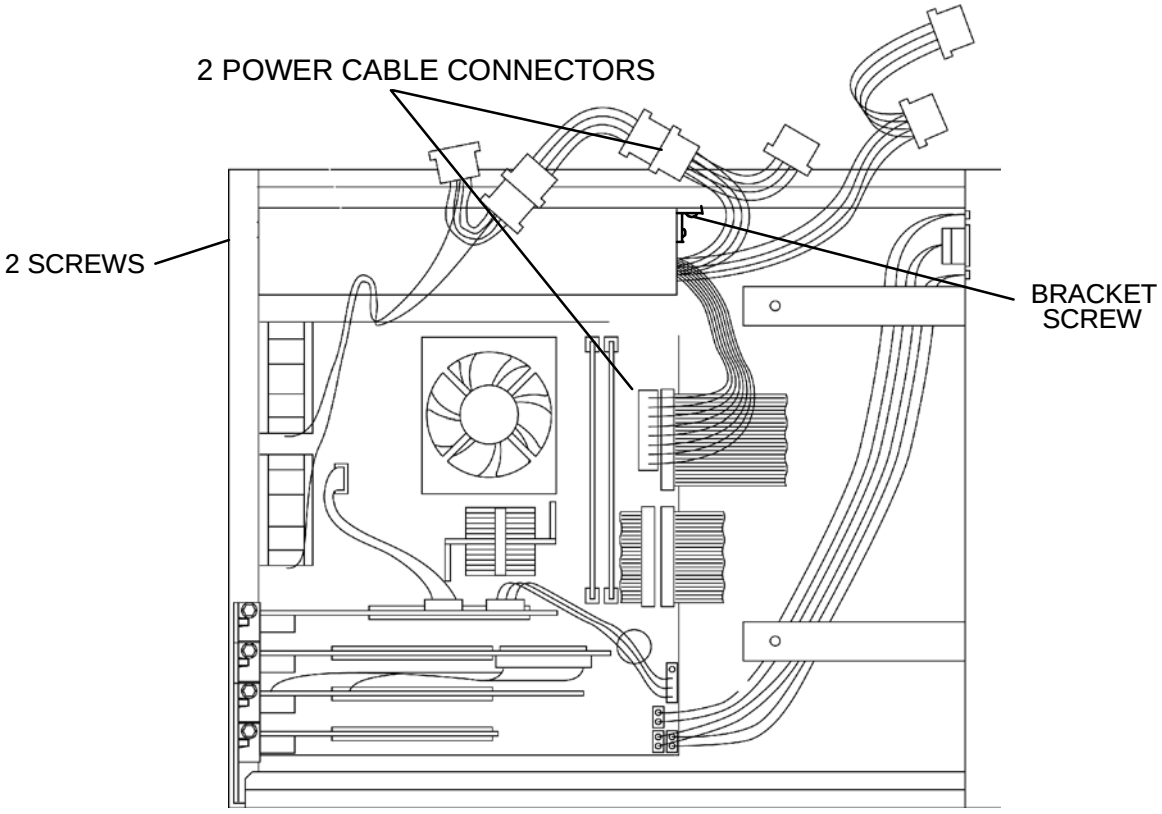


Figure 4-60. Removing the DRE POWER SUPPLY

5. Disconnect 2 POWER CABLE CONNECTORS.

Note

The other POWER CABLE PLUGS were disconnected when the DRIVES were removed.

6. Remove 2 SCREWS from the end of the POWER SUPPLY.
7. Remove 1 BRACKET SCREW.
8. Remove the POWER SUPPLY.
9. Install the new POWER SUPPLY in reverse order of disassembly.

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Section 5 – Tools/Preventive Maintenance/Cleaning

5-1. Required Tools

In addition to standard hand tools (SCREWDRIVERS, WRENCHES, etc.), the following tools are needed to service the IMAGER.

Note

- The listed tools are a subset of the tools required for servicing the *Kodak Dryview 8100.*
- Non-Kodak service technicians are responsible for purchasing items 1 through 3.

1. LAPTOP COMPUTER with the following minimum requirements:
   - Pentium–class IBM-compatible with *Windows* 95/98 or higher Operating System
   - 24 Megabytes of RAM
   - 1.2 Gigabyte internal HARD DISK
   - Internal MODEM, 28.8 Kbps transmission rate
   - NETWORK CARD (10BaseT or 100BaseTX TCP/IP PCMCIA CARD)
   - VIDEO SCREEN – 800 x 600 pixels, 256 colors
   - MOUSE or POINTING DEVICE
   - Web browser software (Internet Explorer 4.0)

Note

These specifications are the minimum configuration needed to use the SERVICE TOOL configuration and diagnostic tools built into the LASER IMAGER software. For information on the SERVICE TOOL, see Section 7.

2. FLUKE DVM, Model 87 (or equivalent)
3. Dual-trace OSCILLOSCOPE:
   - **Band Width**: 0 to 100 MHz
   - **Sensitivity**: 0.5 mv
   - **Accuracy**: ± 3%
4. CABLE, Serial Port — 26-1011-4592-3
5. CABLE, 10BaseT, Crossover — 96-0000-3918–8
6. CABLE, 10BaseT, Straight–Through (PATCH CABLE) — TL5576
7. TEMPERATURE METER KIT — 78-8099-9500-0 (PROBE P/N 26-1011-8560-6)
   (includes *Minco* TEMPERATURE METER and 11-inch bar-type PROBE, factory calibrated as a pair)

Note

If a new PROBE is ordered, the PROBE and METER must be sent in for calibration. See paragraph 5-2.

8. BLOCK (used with PROBE) — 78-8064-5583-4
9. STATIC PROTECTION KIT — 780ST8501
   (includes a static dissipative work surface, GROUND CORD, 2 sizes of WRIST BANDS, and an ALLIGATOR CLIP)
10. CHEMICAL CLEANING KIT — SP7F6028

5-2. TEMPERATURE METER and PROBE Calibration

The TEMPERATURE METER and bar-type PROBE must be calibrated together as a pair at least once a year. Send the METER, PROBE, and calibration form to:

National Calibration and Testing
6960 Madison Avenue West
Minneapolis, MN 55427

The calibration process takes about one week.

5-3. Serial Number Location

The LABEL with the serial number is located on the PROCESSOR FRAME inside the upper HOOD of the LASER IMAGER. Use this serial number to report all service activity. Instruct customers to provide the model and serial number when requesting service.

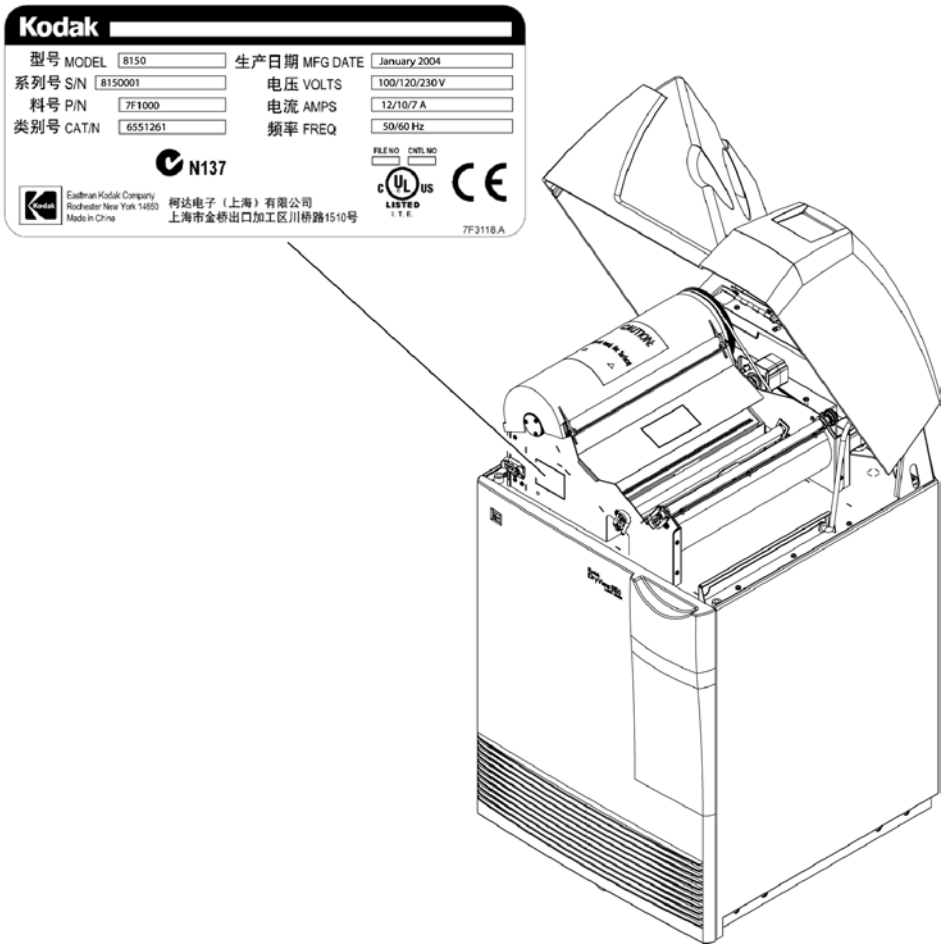


Figure 5-1. Location of LABEL for Serial Number

5-4. Preventive Maintenance

5-4-1. PM Intervals

To consistently produce high quality images, the IMAGER must receive periodic routine maintenance. Perform PM procedures:

- Every EM call
- Every 20,000 MACHINE cycles

Every 20,000 cycles the LOCAL PANEL displays a message prompting the user to schedule preventive maintenance. The procedures listed in the 20,000 cycle checklist should be performed as soon as possible after the 20,000 cycle PM prompt.

To remove the message prompting the user to schedule preventive maintenance and reset the cycle count to 20,000:

1. Select “Prints to PM” on the LOCAL PANEL.
2. Press [Test Print] + [Enter].

5-4-2. Supplies Required for PM

The expendable CLEANING SUPPLIES and replacement parts required for a single 20,000 cycle PM are listed below:

20,000 Cycle PM Supplies:

1. *3M Auto-Pak* TACK CLOTH (1 BAG)	96-0000-0118-8
2. BAG with TIE-WRAP (1)	78-9998-2868-0
3. DEVELOPER DRUM STAND	34-7041-8939-7
4. CHARCOAL FILTER KIT	74-0401-8966-9
5. INSULATED RUBBER GLOVES (Wear these GLOVES during procedures that require handling chemicals.)	77-8007-2908-7
6. FRONT DOOR AIR FILTER	96-0000-2755-5
7. ISOPROPYL ALCOHOL	
8. LINT-FREE CLOTHS (*TEXWIPES*)	78–8005–3779–3
9. SAFETY GLASSES with SIDE SHIELDS (Z87 ANSI-approved)	
10. LOW–LINT ALCOHOL–SATURATED WIPES (*TEXWIPES* TX1065)	1C8287
11. PROCESSOR GASKET	96–0000–5351–0

5-4-3. EM Call Checklist

If the number of MACHINE cycles since the last PM is more than 17,500, use the 20,000 Cycle PM Checklist instead of the EM Call Checklist.

❑ 1. Repair the MACHINE problem that caused the EM call.

❑ 2. Open the UPPER HOOD, open the PROCESSOR COVER, and check the DRUM for damage. If the DRUM is damaged, replace it. (Do step 3 before installing the new DRUM.)

Caution

ISOPROPYL ALCOHOL is highly flammable. Follow the manufacturer's instructions for safe use and handling.

❑ 3. Clean the PROCESSOR ROLLERS (without disassembly). Use ALCOHOL–SATURATED WIPES to wipe the ROLLERS clean.

❑ 4. If you installed a new DRUM, calibrate DRUM temperature (see paragraph 3-1 in Adjustments).

5-4-4. 20,000 Cycle PM Checklist

Every 20,000 MACHINE cycles, perform *all* of the following procedures in the order listed:

- ❑ 1. Print a “flat–field inspection” FILM (i.e., gray–out) to compare against the film after PM is complete.
- ❑ 2. De-energize the IMAGER and open the PROCESSOR COVER.
- ❑ 3. Cool the PROCESSOR for 30 minutes before cleaning the DRUM and ROLLERS.
- ❑ 4. Clean the EXPOSURE PLATEN. Procedure 5-4-5.
- ❑ 5. Replace the AIR FILTER on the FRONT DOOR. Procedure 5-4-6.
- ❑ 6. Replace the CHARCOAL FILTER. Procedure 5-4-7.
- ❑ 7. Remove and check the DRUM. Procedure 5-4-8.
- ❑ 8. Clean the DRUM. Procedure 5-4-9.
- ❑ 9. Clean the HEAT SHIELD and PROCESSOR ROLLERS. Procedure 5-4-9.
- ❑ 10. Clean or replace the FILM DIVERTER ASSEMBLY. Procedure 5-4-10.
- ❑ 11. Replace PROCESSOR GASKET. Procedure 5-4-11.
- ❑ 12. Install the DRUM. Procedure 5-4-12.

Note

After cleaning, place the used LINT–FREE CLOTHS and ALCOHOL–SATURATED WIPES in a BAG (78-9998-2868-0). TIE-WRAP the BAG and dispose of it properly.

- ❑ 13. Complete the PM procedures. Procedure 5-4-13.

5-4-5. Cleaning the EXPOSURE PLATEN

Supplies Required

3M Auto-Pak TACK CLOTH

Cleaning

1. De-energize the IMAGER.
2. Open the FRONT DOOR.
3. Open the PLATEN ACCESS DOOR by sliding the INSERT HANDLE to the left and pulling out.

Caution

The anti-reflective surface of the PLATEN is easily damaged by fingernails and jewelry. Before cleaning the PLATEN, remove any jewelry (rings, bracelets, watches, etc.) that might come in contact with the PLATEN.

Do not snag the CLEANING CLOTH on the CENTERING ARM at the bottom of the PLATEN. If the *3M Auto-Pak* CLOTH catches on parts inside the PLATEN, do not damage the parts when removing the CLOTH. Check for and remove any torn pieces of CLOTH.

4. Reach through the DOOR on the PLATEN and use a *3M Auto-Pak* TACK CLOTH to clean the inside of the PLATEN. Completely clean the curved bottom surface of the PLATEN ASSEMBLY.

Note

The *Auto-Pak* CLOTH will not remove large particles. Use a FLASHLIGHT and remove large particles with your fingers.

5. After cleaning, close and latch the PLATEN ACCESS DOOR and close the FRONT DOOR.

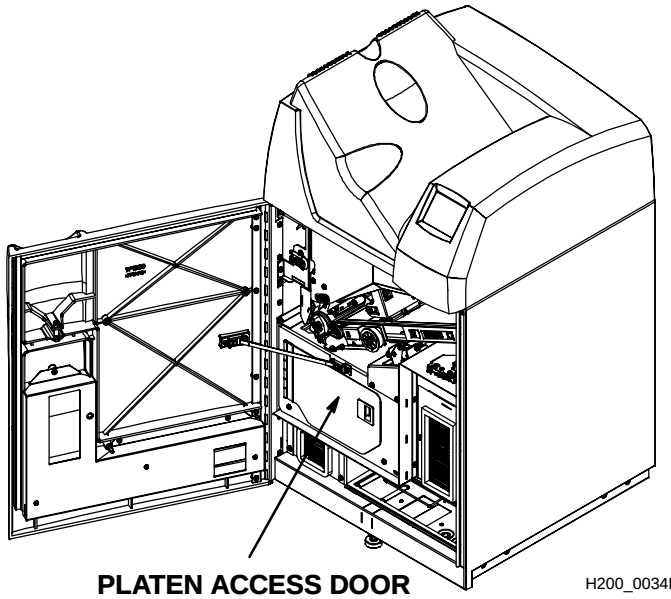


Figure 5-2. Cleaning the PLATEN

5-4-6. Replacing the FRONT DOOR AIR FILTER

Supplies Required

New FILTER

Phillips SCREWDRIVER

Procedure

1. From the LOCAL PANEL, Open the FRONT DOOR.

Warning

When the FRONT DOOR is open, all MOTORS and the LASER are disabled, but the SYSTEM is still energized.

2. Remove 6 SCREWS.
3. Pull off the FILTER COVER (with GASKET and FILTER RETAINER).
4. Remove and discard the old FILTER.
5. Install the new FILTER.
6. Install the FILTER COVER and the 6 SCREWS.
7. Close the FRONT DOOR.

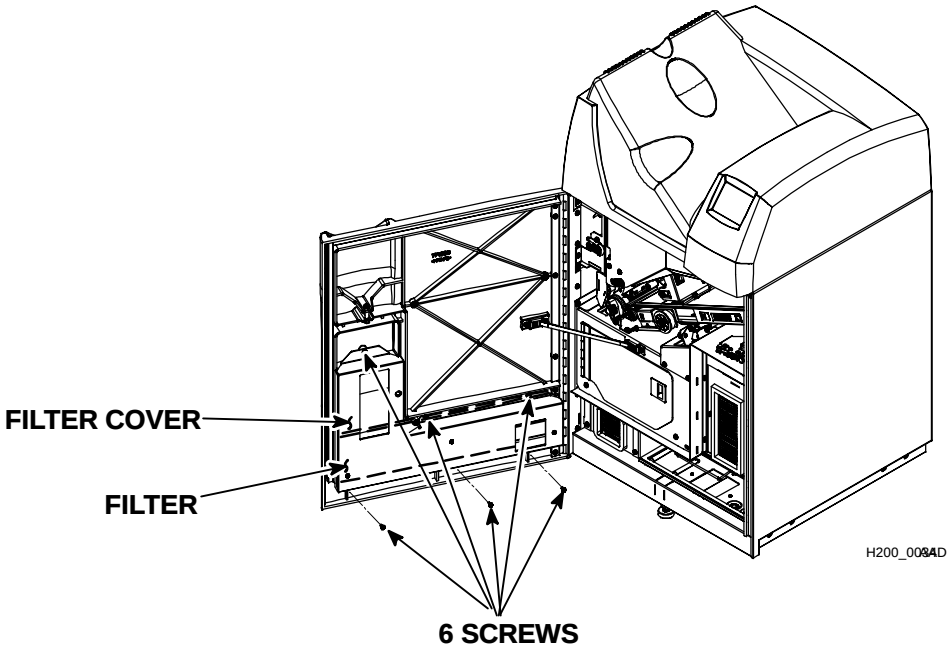


Figure 5-3. Replacing the AIR FILTER in the FRONT DOOR

8. Check the gap between the edge of the DOOR and and the FRAME. The gap should be uniform along the unhinged edge of the door. Often the door gap is wider toward the bottom of the DOOR.

Note

The purpose of aligning the FRONT DOOR is make sure that the EMC GASKET on the DOOR contacts the FRAME all around the DOOR.

- If the DOOR gap is uniform, this procedure is complete. Go on to the next PM procedure.
- If the DOOR GAP is not uniform, continue with step 9.

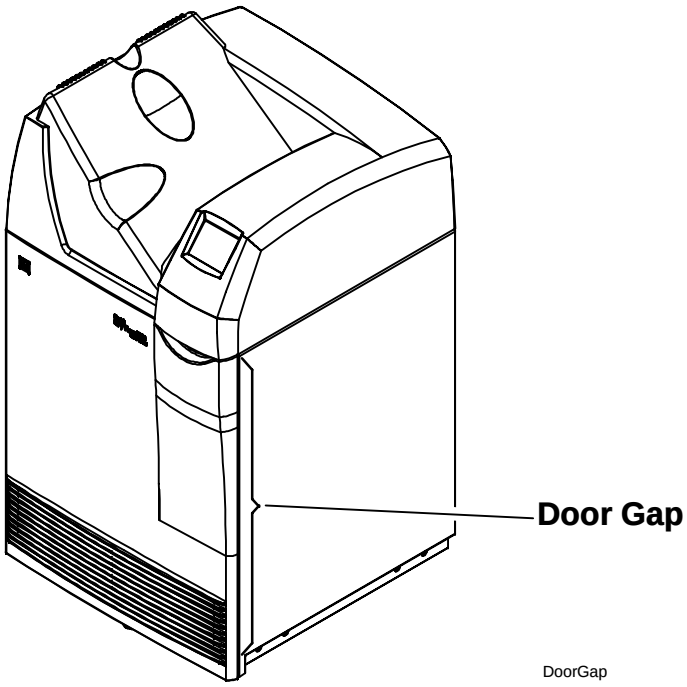


Figure 5-4. Check DOOR Gap

Continued on next page.

9. Adjust the DOOR gap (see Figure 5-5).
   a. Open the DOOR.
   b. Loosen the 3 FILTER COVER SCREWS shown in Figure 5-5.
   c. Place your foot against the outside bottom edge of the DOOR.
   d. Push outward, away from the FRAME, on the top of the DOOR.
   e. Hold the DOOR in position and tighten the 3 FILTER COVER SCREWS.
   f. Close the DOOR.
   g. Check for a uniform gap around the DOOR. Repeat the adjustment if the gap is not uniform.

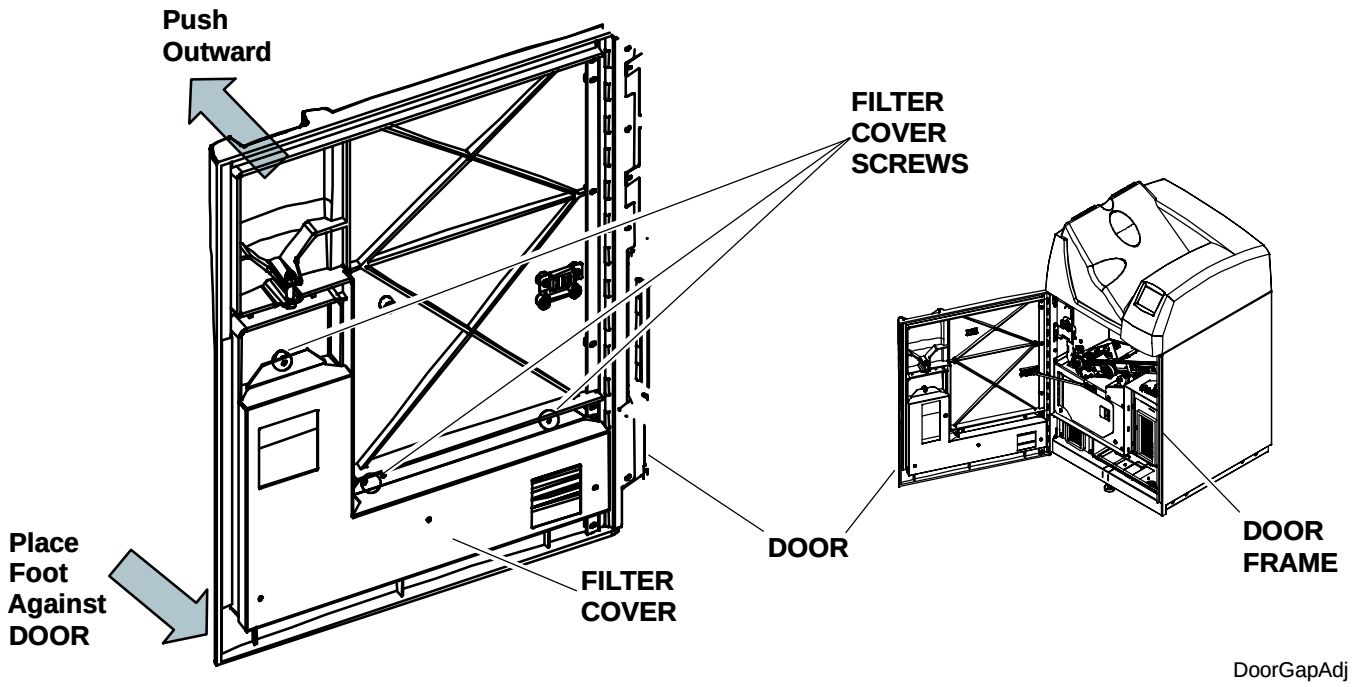


Figure 5-5. Adjust DOOR Gap

Caution

FILTERS can be disposed of as non-hazardous waste. You should discard FILTERS in a landfill or incinerator with energy recovery in a municipal, commercial or industry facility. Contact your state or local government to determine if additional disposal requirements apply.

5-4-7. Replacing the CHARCOAL FILTER

Supplies and Tools Required

New CHARCOAL FILTER

Procedure

1. Open the FRONT DOOR.
2. Push the RETAINING CLIP on the top front of the FILTER back and up and pull out the old FILTER.
3. Slide in the new FILTER all the way to the back stop.
4. Pull the RETAINING CLIP forward and down to lock the FILTER in position. Then close the FRONT DOOR.

Caution

FILTERS can be disposed of as non–hazardous waste. Discard FILTERS in a landfill or incinerator with energy recovery in a municipal, commercial or industry facility. Contact your state or local government to determine if additional disposal requirements apply.

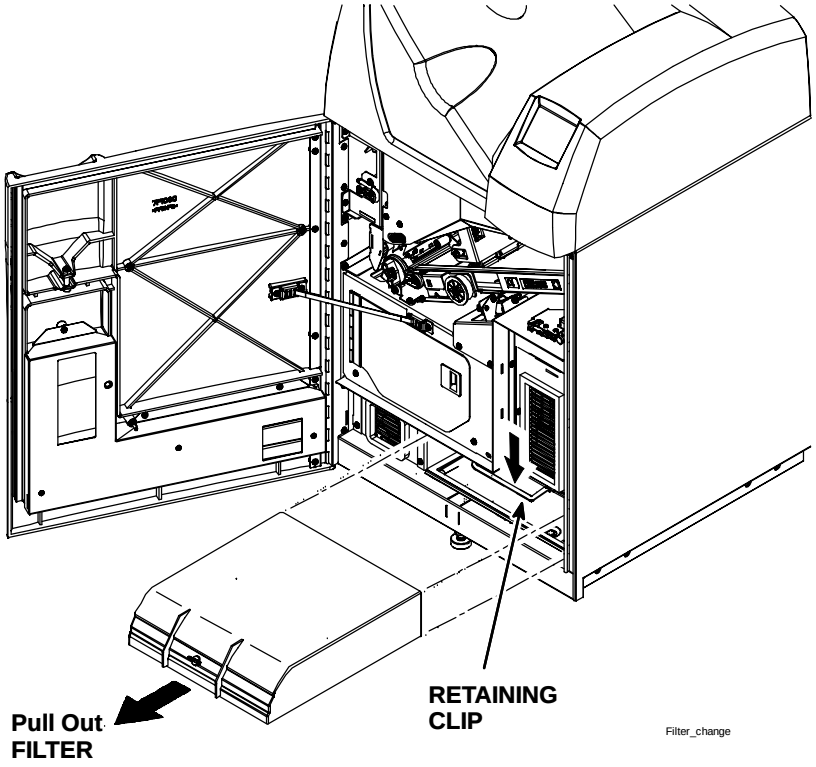


Figure 5-6. Replacing the CHARCOAL FILTER

5-4-8. Removing and Checking the PROCESSOR DRUM

Supplies Required

DRUM STAND

Tools Required

Phillips SCREWDRIVER

Procedure

Warning

Dangerous Voltage

1. Remove the FILM CARTRIDGE, de-energize the IMAGER, and disconnect the POWER CORD.
2. Raise the upper HOOD.
3. Remove 9 SCREWS and remove the REAR PANEL.
4. Disconnect the 2 electrical CABLES extending from the DRUM.
5. Lift the TENSIONER to provide slack and remove the BELT from the DRUM PULLEY.

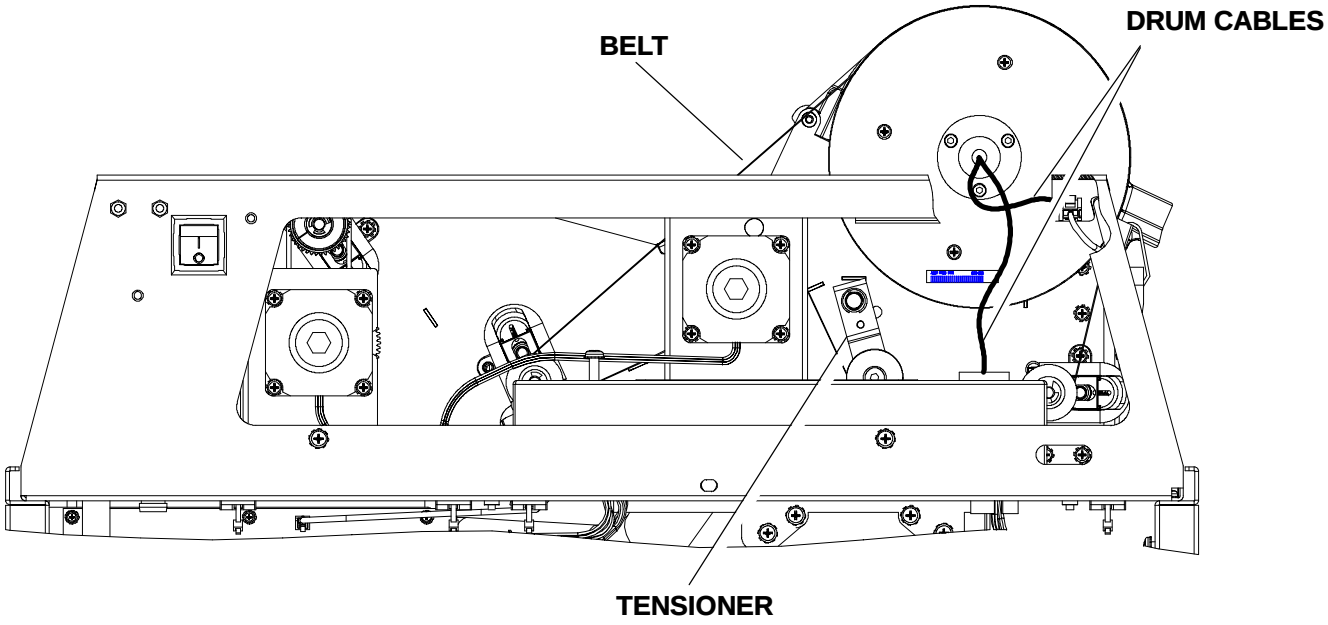


Figure 5-7. Disconnecting the CABLES and BELT on the DRUM

Caution

Hot Surface

When the IMAGER is de-energized, the DRUM and PROCESSOR ROLLERS are hot. Take care while working in this area.

6. Release the CLAMPS on the PROCESSOR COVER, and open the PROCESSOR COVER.

Caution

The DRUM and PROCESSOR ROLLERS are still warm. Handle with care.

The surface of the DRUM is easily damaged by fingernails and jewelry. Before handling the DRUM, remove any jewelry (rings, bracelets, watches, etc.) that could accidentally contact the surface of the DRUM. Do not touch the silicone surface.

7. Grasp the PULLEY on one end of the DRUM. Then grasp the END CAP on the other end and remove the DRUM.

Caution

To avoid damage, do not lay the DRUM on its silicone surface.

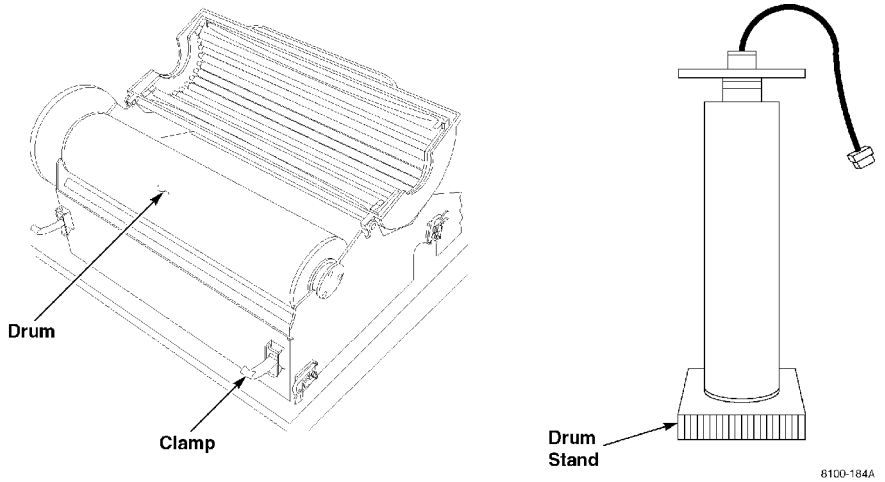


Figure 5-8. Removing the PROCESSOR DRUM

8. Place the DRUM on a DRUM STAND.
9. Examine the surface of the DRUM for damage in the FILM path area. Look for cuts and gouges.

Note

If the DRUM is damaged, replace the DRUM.

5-4-9. Cleaning the DRUM, HEAT SHIELD and PROCESSOR ROLLERS

Supplies Required

LOW–LINT ALCOHOL–SATURATED WIPES

LINT–FREE CLOTHS

ISOPROPYL ALCOHOL

DRUM STAND

INSULATED RUBBER GLOVES

SAFETY GLASSES with SIDE SHIELDS

Caution

- Read the MSDS statements for all cleaning products before doing this procedure.
- Wear appropriate personal protective equipment, protective GLOVES and SAFETY GLASSES with SIDE SHIELDS to avoid contact of cleaning agents and/or FAZ with the skin and eyes.
- ISOPROPYL ALCOHOL is highly flammable. Follow the manufacturer's instructions for safe use and handling.
- Check that there are no ignition sources within at least 3-5 feet of the DRUM. This includes, but is not limited to, cigarettes, SWITCHES, ELECTRICAL OUTLETS, LIGHT BULBS, and flames.
- After cleaning, place used ALCOHOL–SATURATED WIPES in BAG (78-9998-2868-0). TIE–WRAP the BAG and dispose of properly.
- The DRUM and ROLLERS must be allowed to cool for 30 minutes prior to cleaning in a well–ventilated room and with no sources of ignition.
- Do not apply SILICONE OIL to the DRUM surface.
- If the DRUM is damaged, replace the DRUM – do not continue cleaning it. Continue cleaning the other components in the PROCESSOR.

Procedure

1. Remove the DRUM from the IMAGER and place it on the DRUM STAND.
2. Take one ALCOHOL–SATURATED WIPE and begin to wipe down the surface of the DRUM as it is rotated.
3. Continue to rotate and wipe the DRUM down with new WIPES as needed, using one WIPE at a time.
4. Use multiple WIPES to ensure that the entire DRUM surface is clean. (Typically, several WIPES will be necessary for DRUM cleaning.)
5. Leave the ROLLERS in the PROCESSOR FRAME.
6. Clean the ROLLERS with the WIPES. Rotate to clean the full surface. On some occasions, it may be necessary to remove the ROLLERS and use the LINT–FREE CLOTHS with ALCOHOL to clean the ROLLERS.
7. Remove the HEAT SHIELD.
8. Clean the HEAT SHIELD with ALCOHOL–SATURATED WIPES.
9. Install the HEAT SHIELD.

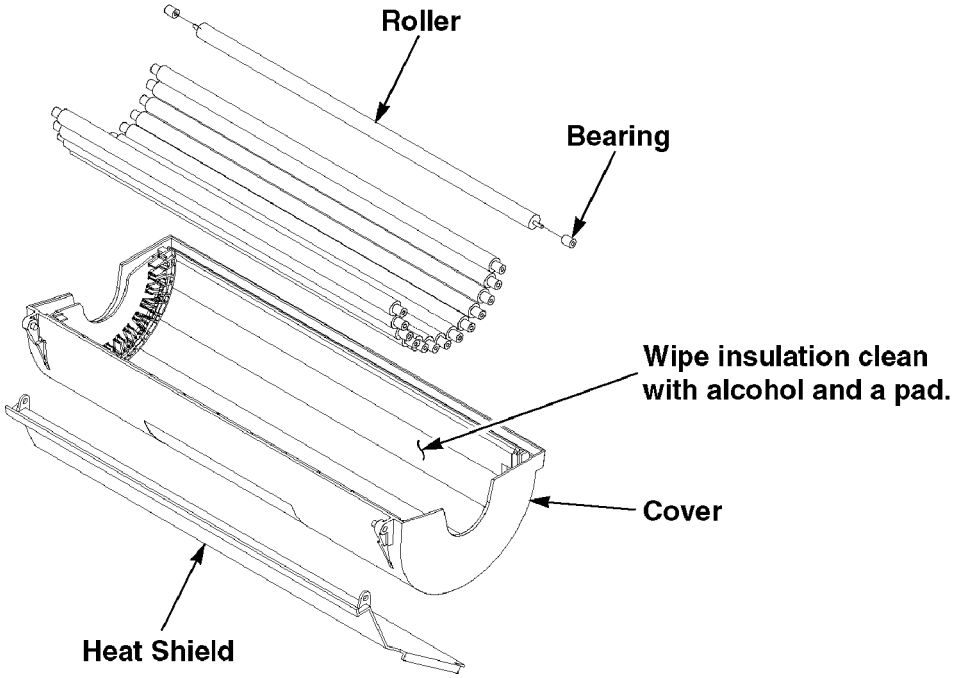


Figure 5-9. Cleaning the HEAT SHIELD and ROLLERS

5-4-10. Cleaning the FILM DIVERTER ASSEMBLY

Supplies Required

LOW–LINT ALCOHOL–SATURATED WIPES

SAFETY GLASSES with SIDE SHIELDS

Tools Required

No. 2.5 ALLEN WRENCH

Caution

- To avoid damage, do not use a sharp instrument for cleaning, and do not attempt to scrape the top of the BLADE or the FELT PAD.
- Wear appropriate personal protective equipment, protective GLOVES and SAFETY GLASSES with SIDE SHIELDS to avoid contact of cleaning agents and/or FAZ with the skin and eyes.
- ISOPROPYL ALCOHOL is highly flammable. Check that there are no ignition sources within at least 3-5 feet of the DRUM. This includes, but is not limited to, cigarettes, SWITCHES, ELECTRICAL OUTLETS, LIGHT BULBS, and flames.
- After cleaning, place used ALCOHOL–SATURATED WIPES in BAG (78-9998-2868-0). TIE–WRAP the BAG and dispose of properly.

A. Inspect the FILM DIVERTER ASSEMBLY

Inspect the DIVERTER ASSEMBLY for damage. Replace only if it is not in good condition or cannot be cleaned. See Installing a New FILM DIVERTER ASSEMBLY below.

B. Cleaning the FILM DIVERTER ASSEMBLY

1. With the FILM DIVERTER ASSEMBLY in place in the IMAGER, clean the **bottom only** of the BLADE by scraping the residue from it with a straight edge. (See Figure 5-10, View A)
2. After scraping, wipe both sides of the DIVERTER BLADE with ALCOHOL–SATURATED WIPES.
3. If you are unable to clean the FILM DIVERTER ASSEMBLY, replace it.

C. Cleaning the Area Adjacent to the FILM DIVERTER ASSEMBLY

1. Clean the SIDEPLATES of the PROCESSOR and the MOUNTING BRACKET for the DIVERTER ASSEMBLY (see Figure 5-10, View A.) by scraping away the residue with a knife or straight blade.
2. After scraping, thoroughly vacuum the area. (Also vacuum the HOOD if debris is present.)
3. Wipe clean the SIDEPLATES and MOUNTING BRACKET with ALCOHOL–SATURATED WIPES.

D. Installing a New FILM DIVERTER ASSEMBLY

Replace the DIVERTER ASSEMBLY only if it is damaged.

1. Remove 2 SCREWS and WASHERS (see Figure 5-10, View B) and remove and discard the used FILM DIVERTER ASSEMBLY (with FELT PAD).
2. Clean adjacent area as described in subparagraph C above.
3. Mount the new FILM DIVERTER ASSEMBLY, but do not tighten the 2 ATTACHING SCREWS (with WASHERS).

Note

The position of the FILM DIVERTER ASSEMBLY must be adjusted after the DRUM is replaced. See paragraph 5-4-12.

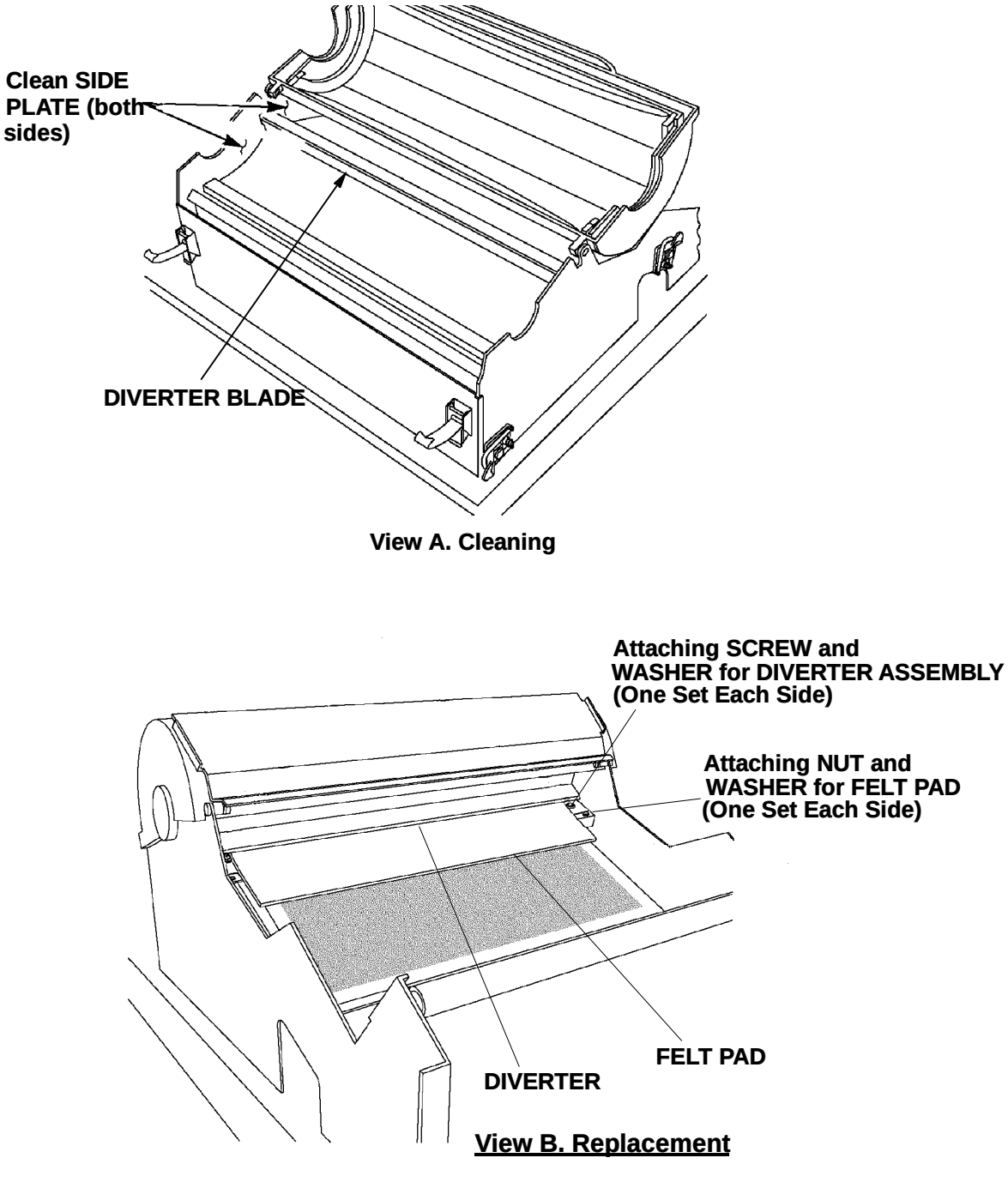

Clean SIDE PLATE (both sides)
DIVERTER BLADE
View A. Cleaning
Attaching SCREW and WASHER for DIVERTER ASSEMBLY (One Set Each Side)
Attaching NUT and WASHER for FELT PAD (One Set Each Side)
FELT PAD
DIVERTER
View B. Replacement

Figure 5-10. Cleaning the FILM DIVERTER ASSEMBLY

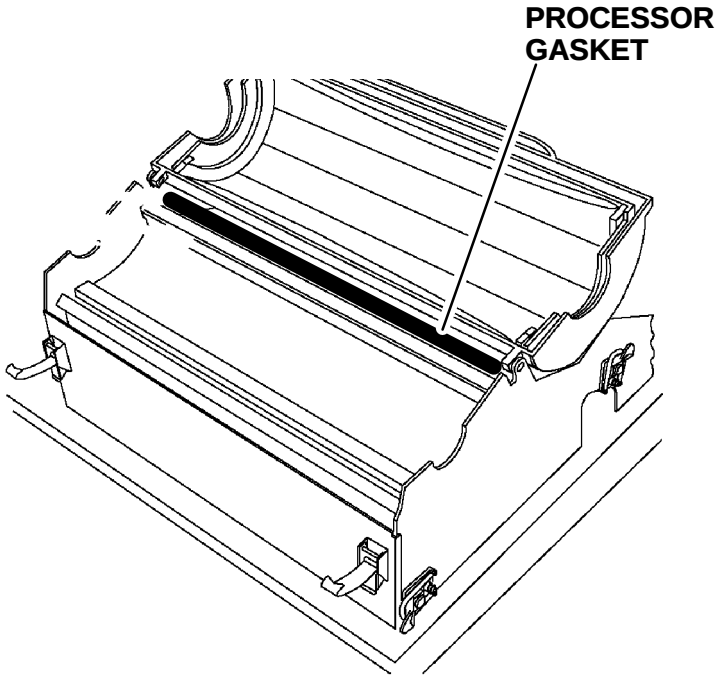
5-4-11. Replace the PROCESSOR GASKET

Supplies Required

New PROCESSOR GASKET

Procedure

1. Pull off the old GASKET and clean the surface.
2. Install the new GASKET. There is pressure–sensitive adhesive on one side of the GASKET.



5-4-12. Installing the DRUM

Supplies Required

Protective GLOVES

Procedure

1. Install the DRUM in the PROCESSOR.
2. Connect the POWER CORD and energize the IMAGER. Allow the DRUM to warm up about 5 minutes.
3. If the FILM DIVERTER ASSEMBLY was replaced, adjust the DIVERTER position as follows:
   a. With the 2 SCREWS loosened, slide the DIVERTER BLADE toward the DRUM.
   b. Set the gap between the DIVERTER and DRUM end caps at 0.38 – 0.50 mm (0.015 – 0.020 in.).
   c. Tighten the 2 ATTACHING SCREWS.
   d. Verify the gap, and readjust as necessary.
4. Close and latch the DRUM COVER.

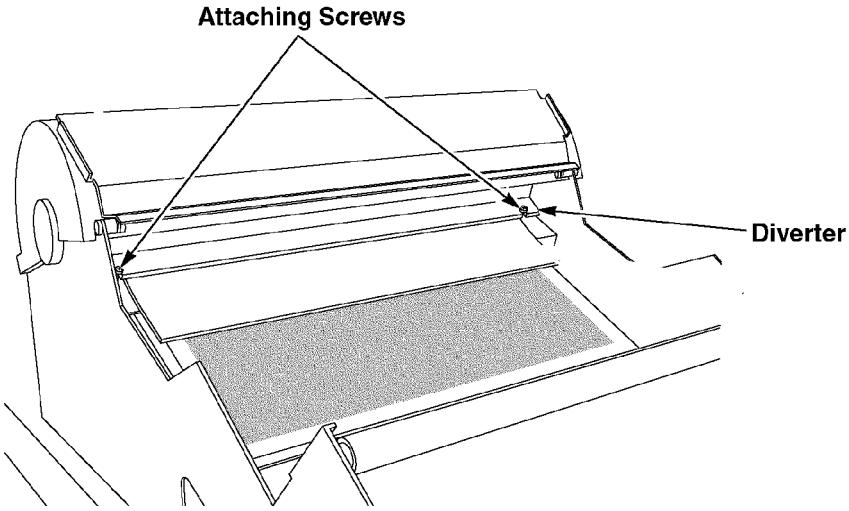


Figure 5-11. Adjusting the DIVERTER

5-4-13. Completing the PM

1. Load a CARTRIDGE of good film and print a “flat-field inspection” film.
2. Compare the “flat-field inspection” film with the film printed before the PM and check that it does not show any image quality problems.
3. Make a print of a “clinical image.”
4. Confirm with the customer that image quality is acceptable.

Perform the following procedure to remove the current message on the LOCAL PANEL prompting the user to schedule preventive maintenance and reset the cycle count to 20,000:

1. On the LOCAL PANEL touch [Menu] .
2. Touch [Service].
3. Touch [PM].
4. Touch [Yes].
5. Enter the Customer First passcode (**cfirst)** on the keypad that appears.

   The message “PM recorded” will appear.
6. Touch [OK].
7. Verify that the “Prints to PM” count has been reset:
   a. Touch the “Back” arrow to return to the Main Menu screen.
   b. Touch “System Information”.
   c. Touch “Print Counts”.

   The “Prints to PM” count should now be 20,000.

5-5. Cleaning the OPTICS MODULE

Note

This procedure is not part of preventive maintenance. Do this procedure only if customer complaints about image quality indicate that dust is lodged on flexible LENS L3 in the OPTICS MODULE.

Service Engineering recommends that you have a replacement OPTICS MODULE available when you respond to an optics–related service call. If cleaning does not eliminate the problem, you will have to replace the OPTICS MODULE.

Symptom: Light density streak across the 14-inch dimension of the FILM. Use the Optics Troubleshooting Training Guide, in the CHEMICAL CLEANING KIT, to help determine corrective actions.

Required Tools:

- CHEMICAL CLEANING KIT (SP7F6028).
  This kit includes:

The CHEMICAL CLEANING KIT includes:

- BOTTLE
- SWABS
- A CD containing:
  - Training Video (.mpeg file)
  - Video Transcript (.doc file)
  - Troubleshooting Guide

Locally Obtained Supplies:

- Non–powdered latex GLOVES
- METHANOL (preferred) or ISOPROPYL ALCOHOL

  These solvents are not included in the kit and must be obtained locally. Follow the safety regulations in your region when carrying and using these chemicals.

Procedure:

1. Study the video on the CD. The video is in MPEG format. If you cannot view the video, read the transcript of the video that is also on the CD. You can view the transcript with a word processor such as *Microsoft Word.*
2. Perform the cleaning procedure as described in the video.
3. If chemical cleaning does not solve the problem, replace the OPTICS MODULE.

Section 6 – Theory of Operation

6-1. General

This section describes operation of the primary components of the IMAGER and provides information on hardware and software features that affect image quality control. It includes descriptions of the following (see Figure 6-1):

- The DICOM RASTER ENGINE (DRE). (See paragraphs 6-2 and 6-3.)
- The Machine Control System (MCS). (See paragraph 6-4.)
- Automatic Image Quality Control (AIQC) and Gray Scale Manager (GSM). (See paragraph 6-5.)

Detailed functions of the DRE and MCS are illustrated on the system block/wiring diagrams in Section 10. Sheet 1 of the diagrams shows the DRE and sheet 2 shows the MCS.

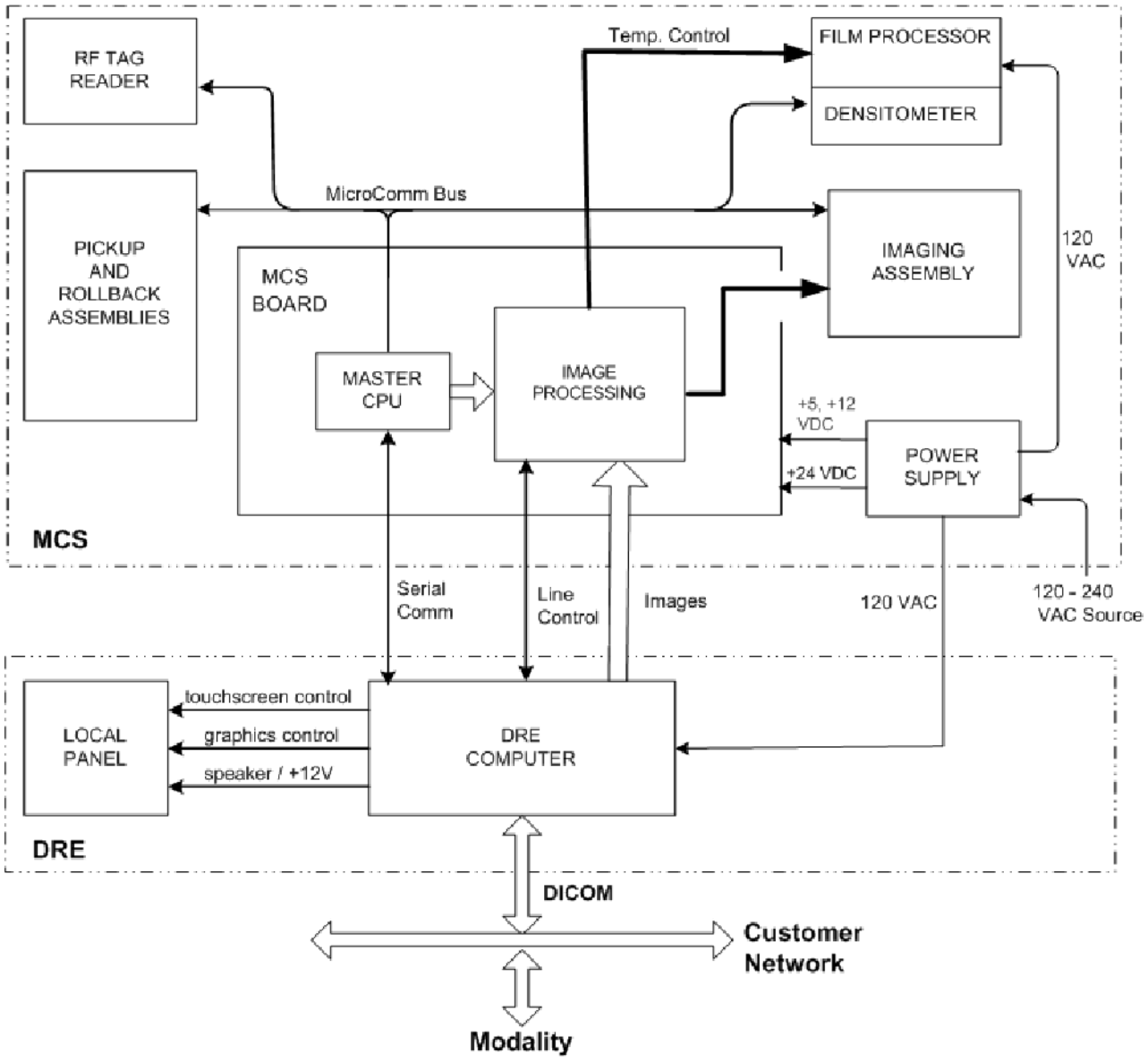


Figure 6-1. LASER IMAGER Block Diagram

6-2. The DICOM RASTER ENGINE (DRE)

The DRE, running on *Microsoft* WINDOWS 2000 O/S, is essentially a *Kodak* MIM 200 PRINT SERVER, with software modified to treat the 8150 IMAGER as a special destination. Providing DICOM Grayscale Print Class Service for the IMAGER, the DRE performs the following basic functions:

- It formats, renders, and rasterizes images received in DICOM format from the network for delivery to the OPTICS MODULE of the IMAGER.
- It provides Web Server interfaces for communication between the user or Field Engineer and the DRE/MCS.
- It supplies +12 VDC power and drive circuits for graphics and touch screen control of the LOCAL PANEL.

6-2-1. DRE Hardware

The DRE system consists of the DRE COMPUTER and the LOCAL PANEL. In the 8100 and 8200 IMAGERS, the LOCAL PANEL was implemented as a MicroComm Bus peripheral to the MCS. In the 8150 IMAGER, as in the 8900 IMAGER, the LOCAL PANEL communicates only with the DRE, and is thus considered a DRE component.

6-2-1-1. DRE Computer Hardware Components

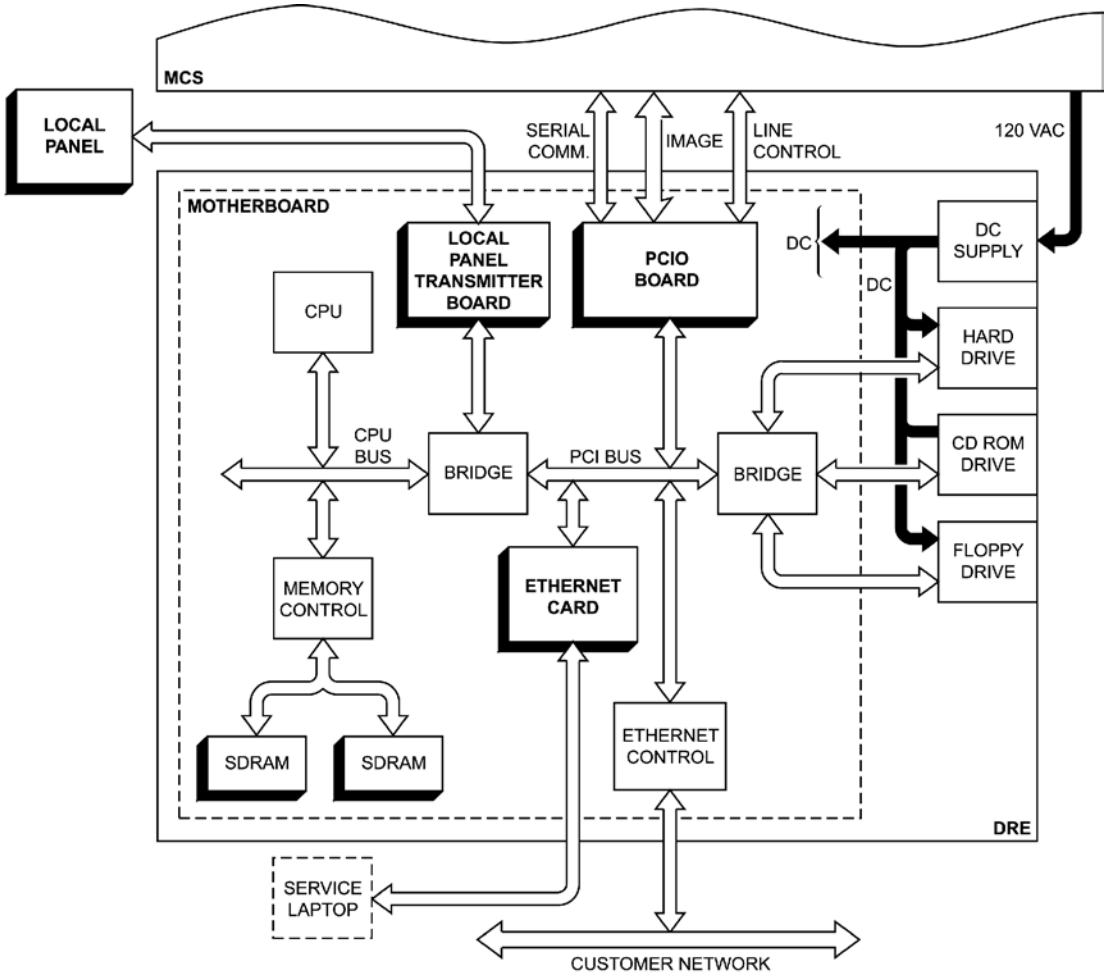


Figure 6-2. DRE Hardware Components

The DRE COMPUTER includes:

- MOTHERBOARD (Single Board COMPUTER)--The MOTHERBOARD, together with a HARD DISK and MAIN MEMORY, formats the images from the MODALITY before they are sent to the MCS for printing. The images are received on the PCI Bus of the MOTHERBOARD from the customer network via the DICOM message exchange protocol. The MOTHERBOARD formats the images in MEMORY and on the HARD DISK DRIVE, then returns them on the PCI Bus to the output circuits of the PCIO BOARD for transmission to the MCS. (See paragraph 6-2-1.)
  - The MOTHERBOARD CPU is a 1.2 GHz Intel Celeron.
  - The MOTHERBOARD works with 256 MB of RAM and an 80 GB HARD DISK.
  - The MOTHERBOARD has 2 Serial ports. (COM1 is not used. COM2 is used for control of the LOCAL PANEL TOUCH SCREEN.)
- MAIN MEMORY--256 MB of SDRAM are contained in 2 DIMM modules which plug into sockets on the MOTHERBOARD. In these memory modules the images received from the MODALITY are rotated, scaled to desired size and then transferred to the HARD DISK for further formatting. When a print request is received, the images are sent from DISK back to MAIN MEMORY, where they are further processed and rasterized for scan-line by scan-line transfer to the PCIO BOARD and the MCS.

- PCIO BOARD--This BOARD, which plugs into the PCI Bus of the MOTHERBOARD, accepts the formatted and rendered images from the PCI Bus and sends them to the MCS on a parallel interface. (See paragraph 6-2-2 for more details.) The BOARD is identical to that used in the 8100 and 8200 IMAGERS.
- PCI 10/100 Base T *Ethernet* CARD--This BOARD provides access to the DRE for the LAPTOP COMPUTER of the FE.
- AGP LOCAL PANEL TRANSMITTER BOARD--This color graphics BOARD drives the LCD CONTROLLER in the LOCAL PANEL.
- HARD DISK DRIVE--This 80 GB IDE DRIVE contains the software that controls image processing. It also provides storage for acquired images before they are sent to MAIN MEMORY for final processing immediately before printing.
- CD-ROM DRIVE--This DRIVE has a capacity of 650 MB and an IDE interface. It is used to upgrade system software.
- FLOPPY DRIVE--This 3.5 inch, 1.44 MB FLOPPY DRIVE is used to back up and restore the system configuration and to download files for service examination.
- DC POWER SUPPLY--This SUPPLY receives 120 VAC input power from the MCS POWER MODULE, and provides the following DC outputs for operation of the DRE and LOCAL PANEL: +3.3, ±5, and±12 VDC.

6-2-1-2. LOCAL PANEL

The LOCAL PANEL, which connects by cable to the LOCAL PANEL TRANSMITTER BOARD in the DRE, contains:

- An LCD DISPLAY
- A TOUCH SCREEN
- A RECEIVER BOARD which includes a BACKLIGHT INVERTER and a SPEAKER.

6-2-1-3. Image Processing in Main Memory

Because the IMAGER scans the “long” way on the page, the acquired image has to be rotated to accommodate it to the 14 by 17 inch page (see Figure 6-3). The image is also “scaled” to convert 8-bit pixels to 13 bits (12 bits data plus 1 bit parity). These processes occur in MAIN MEMORY. After this initial processing the image is transferred to the temporary storage area on the HARD DISK.

When a print request is received, the image data is retrieved from DISK and placed in buffers in MAIN MEMORY. There the image is processed on the fly to customize it per user requests (contrast and density) and film characteristics measured in calibration. The page format is set up and images are sized (interpolated) as requested by the user. Then the image data is rasterized and sent out, scan line by scan line, to the PCIO BOARD, which sends it to the MCS for printing.

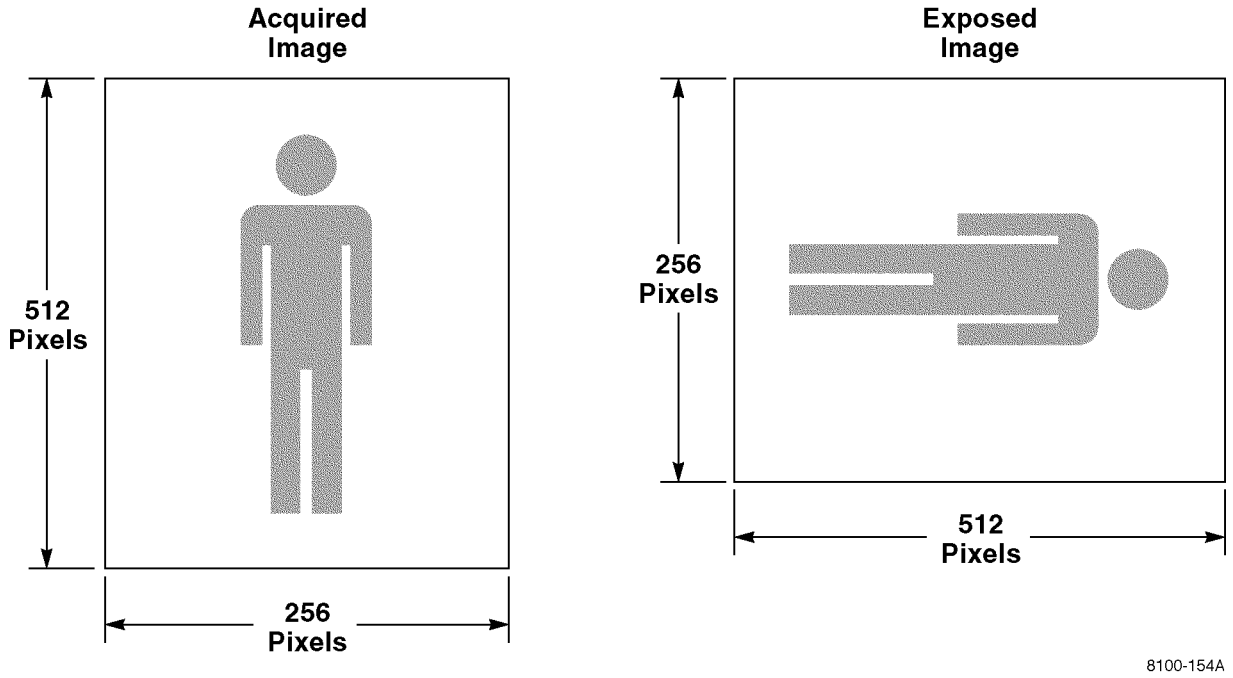


Figure 6-3. Image Rotation

6-2-2. PCIO BOARD

The PCIO BOARD plugs into the PCI Bus of the MOTHERBOARD. Thus it is “on-line” with the CPU, DIMM MEMORY and HARD DISK of the COMPUTER. The image cable from the DRE to the MCS plugs into the output side of the BOARD. The PCIO BOARD provides the following interfaces for image data and serial communications (see Figure 6-4):

- A 12-bit (plus parity) digital output circuit for handling pixel data to be sent to the MCS.
- A UART channel for serial communication with the MCS.

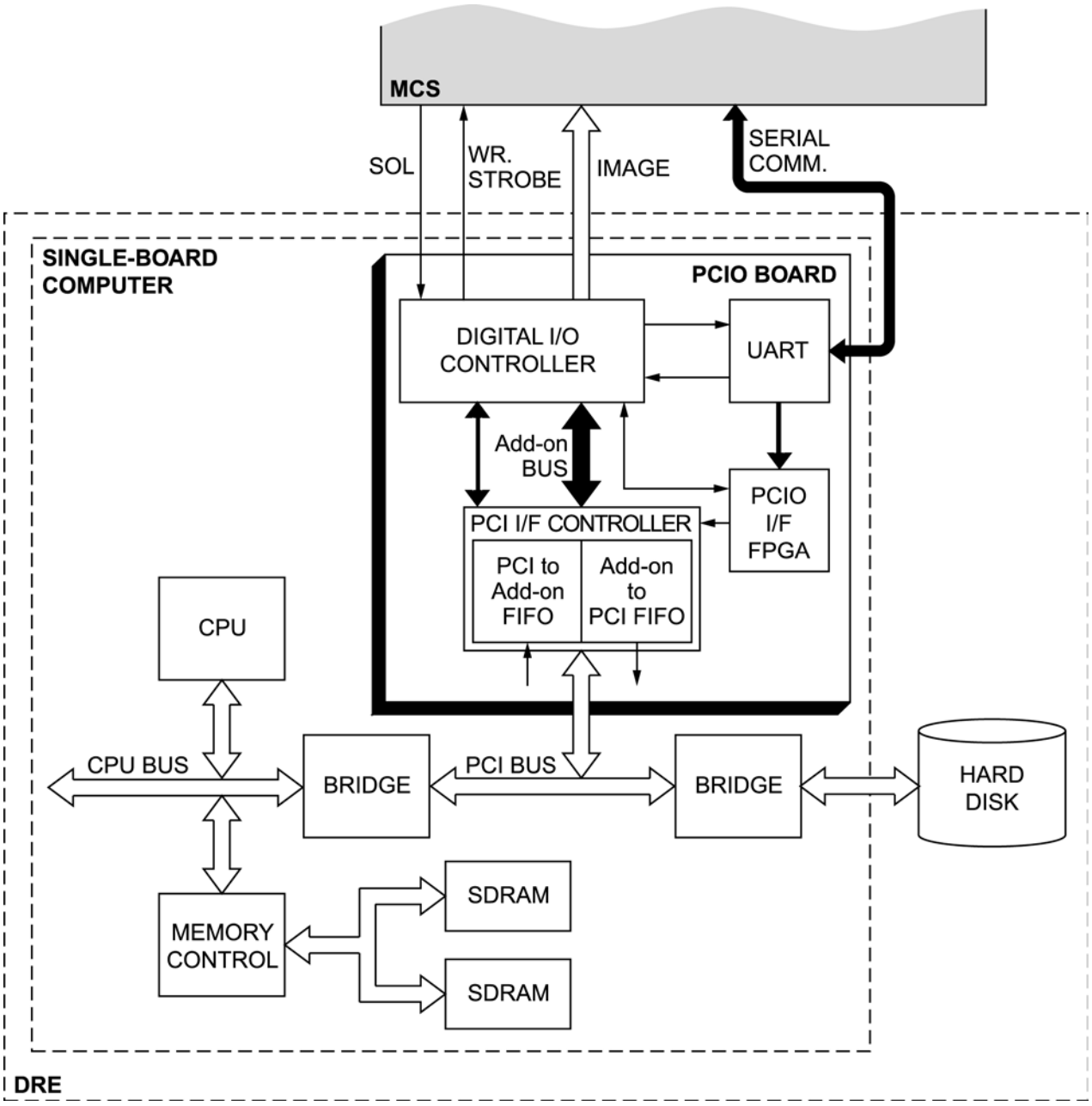


Figure 6-4. PCIO BOARD Components

6-2-2-1. Digital Output Circuit

The purpose of the output circuit is to move data out of the PCI to Add-on FIFO as pixels are written to it, after an SOL (Start of Line) signal has been issued by the MCS. The data passes through the Digital I/O Controller FPGA from the PCI to Add-on FIFO. The PCIO Interface FPGA arbitrates use of the Add-on Data Bus for the passage of data. Following is a typical output sequence:

1. Reset the output interface.
2. Write the number of pixels per line into a transfer counter.
3. Configure the PCIO Interface chip for bus mastership and to interrupt upon transfer count completion.
4. Issue the print command to the MCS.

5. Wait for the transfer complete interrupt from the PCIO Interface chip.
6. Verify that the transfer counter reached zero, indicating that all the pixels expected to be transferred were actually transferred.

6-2-2-2. UART Circuit for Serial Communication with MCS

One channel of a DUART on the PCIO BOARD is used for serial communication with the MCS. The serial lines to and from the MCS connect with the UART in the MASTER CPU on the MCS BOARD. On the PCIO side of the UART, communication is implemented on the pass-through bus of the PCI Interface Controller. Data is passed to and from the UART (on the PCIO side) as 8-bit data. When serial data is received by the UART from the MCS, the UART generates an interrupt that is sent to the PCIO Interface FPGA, which controls activity on the Add-on Bus of the PCIO BOARD.

6-3. DRE Software

The DRE COMPUTER is responsible for acquiring, queueing, and controlling DICOM Basic Grayscale Print Class jobs received from up to12 SCUs, processing the images, and sending them to the MCS for printing. It functions as a MIM PRINT SERVER. The DRE also runs a Web Server that communicates with the LOCAL PANEL and the SERVICE TOOL to allow users and Field Engineers to monitor and control the system.

6-3-1. General Software Functions

A typical film session might use the following negotiations between a MODALITY (SCU) and the DRE serving as a MIM:

1. The SCU establishes an association with the DRE and negotiates the Basic Grayscale Print Class service.
2. The SCU queries status of the IMAGER.
3. The DRE responds with status (busy or ready).
4. The SCU instructs the DRE to create a Film Session, Film Box(es), and Image Boxes, and to set attributes for these boxes.
5. The SCU sends the DRE all the image data necessary for the print job, followed by an N–ACTION request.
6. The DRE sends the rendered image data to the MCS, and notifies the SCU when the image is successfully queued.
7. The MCS prints the image using the specified attributes (see step 4).

The DRE communicates with the SCU (MODALITY) over the DICOM network. It communicates with the MCS on several lines in a single cable between the PCIO BOARD in the DRE and the MCS BOARD in the MCS:

- A parallel image interface (12 bits plus parity) between the PCIO BOARD of the DRE and the IMAGE BUFFER in the MCS BOARD.
- 2–way serial message lines between the DRE and the MASTER CPU on the MCS BOARD. These lines use an SNMP serial protocol to carry the commands that the DRE uses for high level control of the MCS exposure engine.
- A DRE Write Request line to the MCS from the DRE and an SOL (Start of Line) command from the MCS to the DRE.

6-3-2. Main DRE Software Components

The main DRE software components that control and coordinate print jobs are shown in Figure 6-5 and described in the following paragraphs.

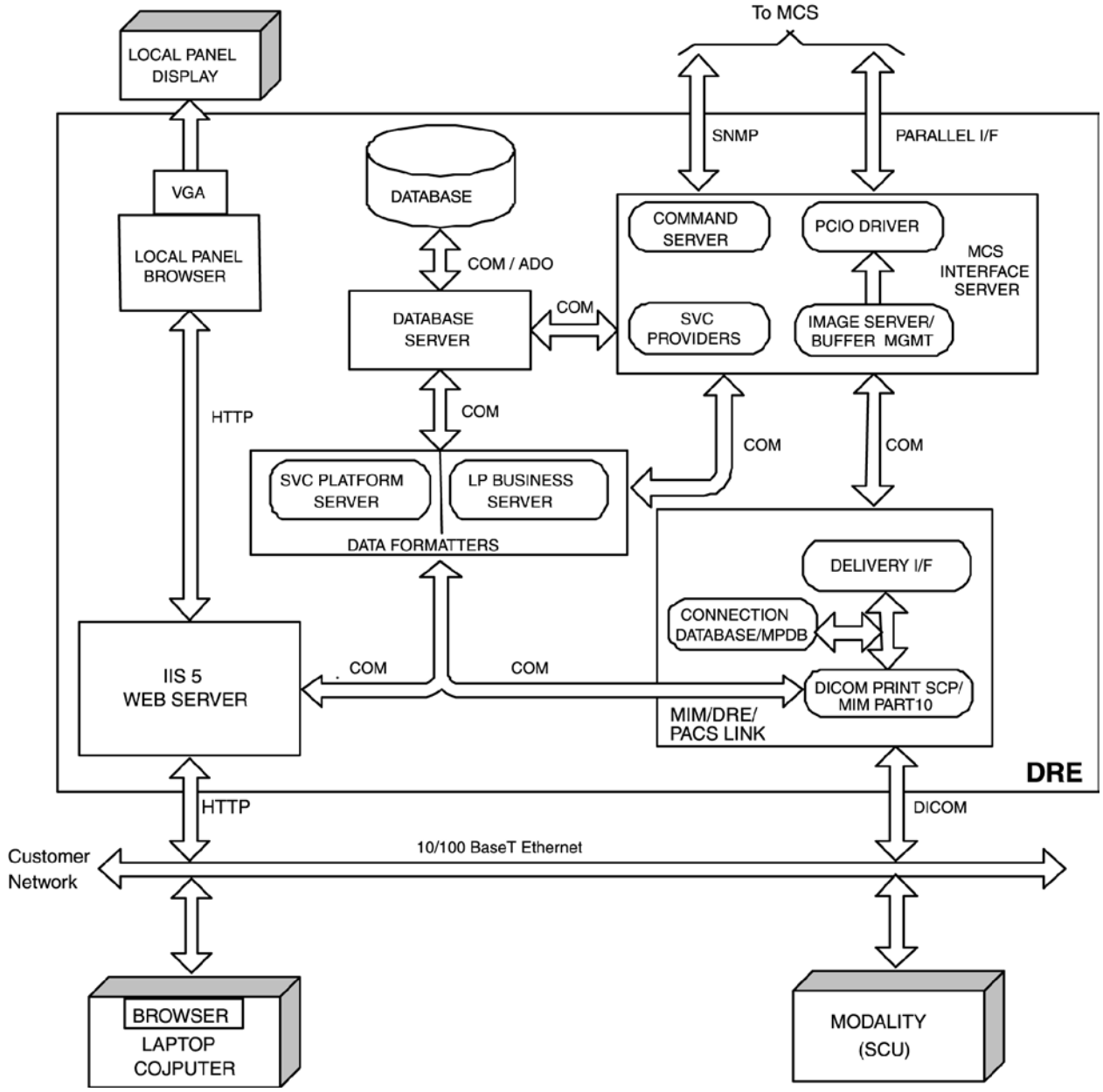


Figure 6-5. DRE Software Components

6-3-3. *PACSLink* MIM

The PACSLink MIM software used in the DRE is a subset of the standard Print Server control software used in previous Kodak MIM products. The “standard” PACSLink software has been modified to include a “Delivery Interface” component which treats the 8150 IMAGER as a special destination. Also, the software has been extended to incorporate into the Connection Database and Print SCP functions the new DICOM Modality Preferences Database to support customer installation of the 8150 IMAGER. General functions of the PACSLink MIM software include:

- Provide software interfaces between PACSLink and the LOCAL PANEL and SERVICE LAPTOP to allow the DRE to communicate with the LOCAL PANEL and the SERVICE LAPTOP and to deliver jobs from an SCU to the MIM Delivery Interface for rendering.
- Handle setup and configuration of the SCUs identified in the Connection Database.
- Support controlled startup and shutdown of the DRE.
- Accept or reject print requests from DICOM, depending on the usability of SCU-specified parameters for the print job.
- Accept and queue valid print jobs from an SCU for transmission to the MIM Delivery Interface component of the PACSLink software, and maintain maximum throughput of the jobs to achieve printing of 1xx sheets per hour, for 35 by 43 cm FILM.
- Support requests from the LOCAL PANEL or SERVICE TOOL to generate test prints, take the spooler off–line and then on–line, do queue management, retrieve jobs, delete jobs, reprint jobs, and display status and error conditions.
- Handle error reporting and job recovery, and support N–EVENT reporting to the SCU.

When the PACSLink receives images from an SCU, it writes them into the image cache partition of the HARD DISK as *Microsoft* WINDOWS files. PACSLink retains the job information and connections to the images, but not the images themselves. The available space in the image cache partition is monitored by PACSLink with reference to 2 configurable set points, a “high water mark” and a “low water mark”. If the cache is filled to the high water mark, successfully delivered jobs/images are deleted, oldest first, until either the low water mark is reached in disk space or there are no more delivered jobs/images available to delete. If sufficient disk space cannot be made available, no jobs will be accepted from an SCU.

Images from the cache are rendered in memory (SDRAM) in global memory-mapped files. The process of rendering is controlled by the MIM Delivery Interface.

6-3-3-1. MIM Delivery Interface

The MIM Delivery Interface receives the print job (Information Model), then processes and renders the image data stored on the HARD DRIVE into a full page, edge-to-edge, raster image. After rendering, it passes the page to the MCS Interface Server (MIS) software for transfer to the MCS. MIM Delivery Interface supports the following functions:

- Full page rendering of all supported film sizes, including implementation of image rotation, magnification, border, time stamp, Dpatch, and annotation.
- Image processing to create T-values that use the following variables: TimageMin, Timage Max, Dmax, Dmin, TFT, Contrast, and Polarity, then conversion of these T-Values into laser values.

Figure 6-6 shows the main functions used in rendering the page.

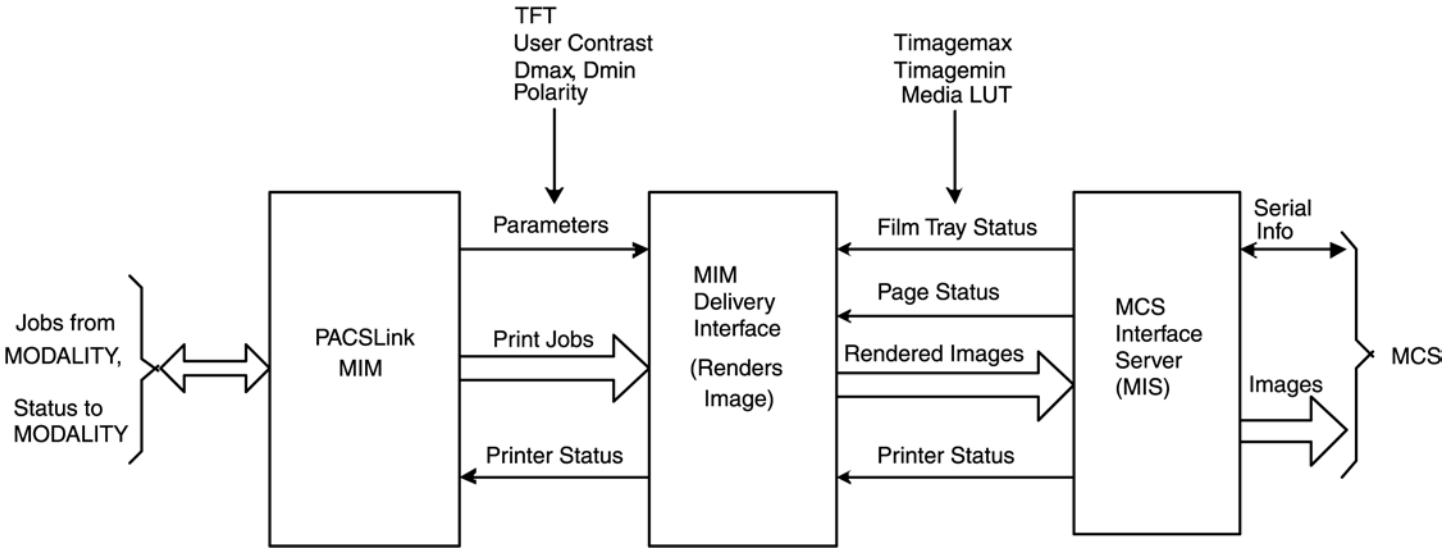


Figure 6-6. Functions of the MIM Delivery Interface

1. MIM Delivery Interface receives “Film Tray Status”, TimageMin, TimageMax, and Media LUT values from the MCS.
2. Pixel data is converted to 12 bits, representing values in the range of 0 – 4095, based on the TimageMin, TimageMax and Media LUT values, together with user-selected values for the following parameters: TFT Set, Contrast, Dmax, Dmin, and Polarity. The 12-bit values sent to the MCS Interface Server are not T-Values, but LASER DIODE values that will require no additional processing.
3. MIM Delivery Interface renders the Print Job into one or more images and transfers the Image(s) to the MCS Interface Server.
4. “Page Status” from the MCS Interface Server is used to track the success or failure of jobs delivered to the MIM Delivery Interface.
5. “Printer Status” from the MCS Interface Server is sent back to the SCU. It also triggers starting or stopping of image rendering in the MIM Delivery Interface.

MIM Delivery interface formats the page for image size and feed orientation, DICOM format and orientation, and positioning of the Dpatch (if used) and the clear leading edge. It renders the image by mapping image data to T-Values using the following information:

- User-requested data that is received with the print job from the PACSLink software. This includes a TFT set, a contrast table number, Dmax, Dmin, and Polarity.
- Film cartridge data received from the MCS through the MCS Interface Server. This includes TimageMin, TimageMax, and Media LUT.

A contrast table is selected from the TFT set and changed as follows. TFT data values are adjusted first based on the user Dmax or the TimageMax value, whichever is lower, and user Dmin or TimageMin, whichever value is higher. The changed values are then interpolated into a Contrast Lookup Table (LUT) with 4096 entries (0 – 4095), checking that the output T values are within the range of the required Dmax and Dmin. If Reverse Polarity is requested, the LUT is reversed.

The MIM Delivery Interface applies the Media LUT to the rendered image pixels to convert the T-values to laser values, which are sent to the MCS Interface Server. All images are in 12–bit pixels. If the images input from PACSLink MIM are 8 or 10–bit, they are scaled to 12–bit.

6-3-3-2. DICOM Modality Preferences Database (MPDB)

The MPDB, newly implemented with the 8150 IMAGER, is a repository of “SCP Services” parameters for all MODALITIES that have been qualified to work with the IMAGER. These parameters are keyed to the unique DICOM Implementation UID and version name of each MODALITY. These DICOM attributes are made available to the IMAGER during the establishment of the DICOM association that occurs when the MODALITY sends an image to the IMAGER. When the association is established, the default ”SCP Services” parameters that are appropriate to the type of MODALITY are selected and applied from the MPDB.

As new MODALITIES are qualified, the MPDB can be updated in IMAGERS in the field with the appropriate parameters for the new MODALITIES.

6-3-4. MCS Interface Server (MIS)

6-3-4-1. General

MIS coordinates transfer of rendered image data from the MIM Delivery Interface to the MCS, and handles all command, diagnostic, and asynchronous event communication between the DRE and MCS. The MIS is a standalone COM server whose clients include MIM Delivery Interface, the LOCAL PANEL, the SERVICE TOOL, and the MCS. It includes the following software components: the MCS Image Server and PCIO Driver, the MCS Command Server, and Service Providers. The MIS in general:

- Handles all datapath commands from the MIM Delivery Interface, and makes sure that the MIM Delivery Interface has the correct AIQC information for page rendering.
- Delivers rendered images through the PCIO BOARD to the MCS.
- Performs error and activity logging for the MCS, and includes a power on self-test that automatically runs diagnostics at system startup.
- Provides the main access point for diagnostics executed through the SERVICE TOOL. It supports a complete set of calls for the diagnostics available on each subsystem of the MCS.

6-3-4-2. MCS Image Server

The MCS Image Server, which coordinates all image transfers to the MCS, includes the software driver for the PCIO BOARD. The MCS Image Server accepts a rendered image from the MIM Delivery Interface, prepares the PCIO BOARD for DMA transfer of the image, and controls the transfer. Its tasks include:

- Managing 2 page buffers for rendered images.
- Initializing a page buffer for DMA transfer to the MCS via the PCIO BOARD.
- Starting the DMA transfer when commanded by the MIS.
- Handling status and errors for the PCIO BOARD.

Note

The page buffers managed by the MCS Image Server are located in physical memory in the DRE (in SDRAM) which is reserved for page buffer use by means of the MAXMEM parameter in the BOOT.INI file of *Windows* 2000. The PCIO Driver maps this physical memory, which cannot be used by *Windows* 2000 for other purposes, for use as a page buffer. This technique is required to meet specific data transfer timing requirements of the PCIO BOARD.

6-3-4-3. MCS/MIS Command Server

The MCS/MIS Command Server handles all command messages between the DRE and the MCS. The communication link between the DRE and the MASTER CPU of the MCS is over a serial channel. This channel requires a different communication protocol from the interfaces used for the other software components in the DRE, which use Microsoft COM (Component Object Model). The Command Server uses the SNMP v1 protocol to couple the DRE and the MCS in a reliable way that tolerates lost or damaged packets. MCS Command Client converts the command requests from DRE clients to the SNMP protocol to communicate with the MASTER CPU on the MCS BOARD.

6-3-4-4. Service Providers

The Service Providers are COM interfaces that provide access to software components of the DRE and to the MCS subsystems through the MCS Interface Server to allow the SERVICE TOOL to perform configuration and diagnostics.

6-3-5. MCS Database Server

This database stores information that is specific to the MCS rather than the DRE. It includes:

- Error IDs, tallies, and histories
- Service history
- Diagnostic results and data (temporary)
- Cartridge information, status and history
- Statistics – prints, film size, prints since last PM.
- Localization tables and configuration data

6-3-6. Web Server

The Web Server is vendor-purchased Microsoft Personal Web Server v4.0, which is supported by the *Microsoft* WINDOWS 2000 O/S. It is the access point for both the SERVICE LAPTOP and the LOCAL PANEL. The Web Server uses a combination of web technologies (HTTP, XML, Active Server Pages, SOAP) to allow the user and FE to communicate with and control the functions of the DRE.

6-3-7. Browsers for SERVICE LAPTOP and LOCAL PANEL

The browser used by both the SERVICE LAPTOP (running on the LAPTOP) and the LOCAL PANEL (running on the DRE COMPUTER) is *Microsoft* INTERNET EXPLORER v5.x. The browser for each component must support the following software: Active X controls, SOAP protocol, and XML data parsing.

6-3-7-1. Active Server Pages (ASP) for SERVICE LAPTOP and LOCAL PANEL

These components represent ASPs that run within the Web Server Process and create pages to support the LAPTOP and the LOCAL PANEL. These pages can access COM software components to obtain dynamic data. The SERVICE TOOL ASP supports display of diagnostic data.

6-3-7-2. Data Formatters for Service Tool and LOCAL PANEL

These components provide “business logic” that communicates with other software components to maintain up-to-date information that the SERVICE TOOL or LOCAL PANEL might need to access or display. The Data Formatters decouple the presentation and delivery of data from the collection, management, and formatting of the data, and they filter and format the data if necessary.

6-4. Machine Control System (MCS)

The MCS controls the operations involved in handling film and exposing, processing, and controlling quality of the image on the film. The MCS includes the following major components:

- MCS Board––This board contains the Master CPU and auxiliary circuits that control operation of all MCS components. It communicates on a MicroComm Bus with slave micro subsystems located on several peripheral boards that are part of the MCS. (These boards are described below.) Other functions of the MCS Board are as follows:
  a. It receives the rasterized image data from the DRE, passes it through AIQC circuits, and converts it to an analog signal which drives the laser diode.
  b. It receives power from a DC Power Supply and distributes it to the components of the laser imager.
  c. It interfaces with system interlocks and a service switch that are available to control power in potentially hazardous situations.
  d. It contains circuits that directly drive several dc and stepper motors, and receive inputs from several sensors See sheet 2 of the 8150 Functional Diagrams. (Functional Diagrams are on the *Kodak* Health Imaging Digital Output Service Collection CD set.)

Note

The MCS micro slave/master system is described in paragraph 6-4-1, and functions of the MCS Board are described in more detail in paragraph 6-4-2.

- Laser Optics Subsystem and Optics Module Control Board––The laser optics control scanning and exposure of the film. The Optics Module Control Board contains a slave micro system that controls the Optics Spinner Motor and Attenuator Motor, and receives sense inputs from the Attenuator Home Sensor and Shaft Index Sensor. This board also houses the laser SOS (Start of Scan) Detector that synchronizes image scanning, and the Laser Beam Power Monitor. Laser power (± 12 vdc) and the image drive signals (analog) are routed from the MCS Board through this board to the laser. (See paragraph 6-4-3.)
- Densitometer Board––Contains a slave micro, A/D converter and PAL that measure film density and report it to the Master CPU. Two density measurements are made during normal imager operation: (1) The Dpatch on the trailing edge of each sheet of film is checked and (2), Step wedges are measured on test calibration film. (See paragraph 6-4-4.)
- RF Tag Subsystem––This subsystem includes three boards: An RF Tag Interface Board, an RF Reader (Transceiver) Board, and an RF Antenna Board. The RF Tag Interface Board contains a slave micro system that controls reading and reporting of the data on the film cartridge RF tag. The slave micro receives commands from the MCS and communicates with the RF Reader Board to either read from or write to the RF tag. (See paragraph 6-4-5.)
- Feeder Board––Contains a slave micro system that, under control of the MCS Master CPU, drives the film handling motors and receives status from various film sensors. (See paragraph 6-4-6.)
- Processor Interface Board––This board contains relays that route 120 vac power to the Processor heater under control of the MCS Board. (See paragraph 6-4-7.)

6-4-1. Master/Slave Micro System

6-4-1-1. Serial Communication Protocol

The MCS uses MicroComm Serial Communication Protocol to allow the Master CPU on the MCS Board to communicate with distributed micros on a simple, low-cost serial interface. Slave micros are included on the following circuit boards:

1. Optics Module Control Board (Slave 1)
2. Densitometer Board (Slave 2)
3. RF Tag Interface Board (Slave 3)
4. Feeder Control Board (Slave 4)

6-4-1-2. Physical Interface

The physical interface includes only a TXD (transmit) line, an RXD (receive) line and a Reset line (see Figure 6-7). In this configuration the RXD lines of all slaves are tied together and connected to the TXD line of the Master CPU, and the slave TXD lines are tied together and connected to the RXD line of the Master CPU.

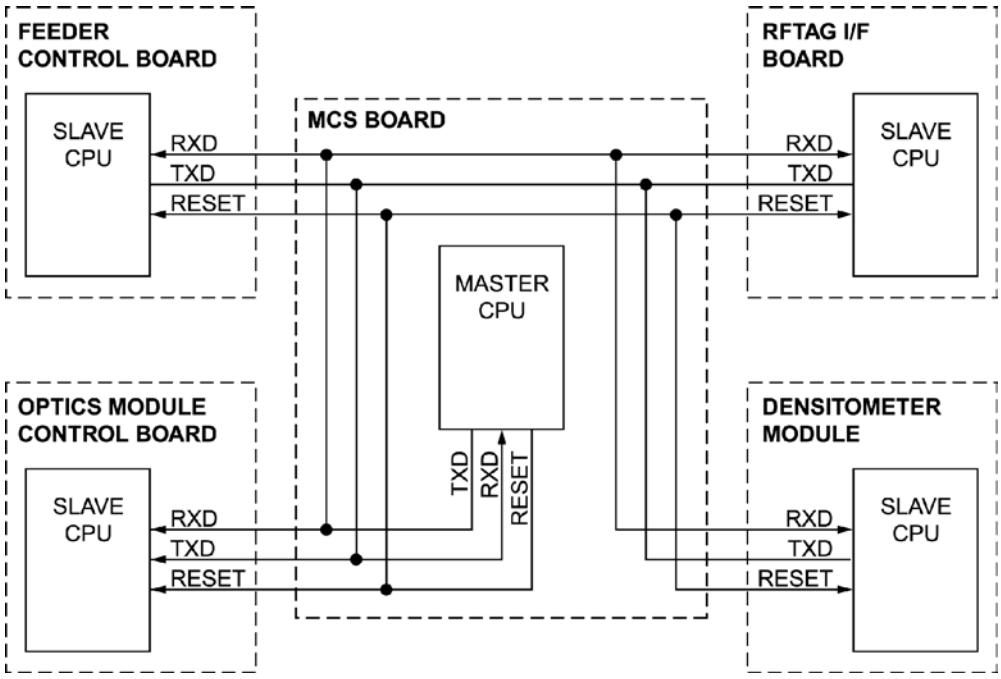


Figure 6-7. Master/Slave Physical Interface

6-4-2. MCS Board

The MCS Board contains the Master CPU and auxiliary circuits that control the electromechanical components of the laser imager. See sheet 2 of the 8150 Functional Diagrams. (Functional Diagrams are on the *Kodak* Health Imaging User and Service Documentation Library CD set.)

The MCS Board also provides a pixel data path from the DRE to the laser and includes a Media Lookup Table (LUT) and associated AIQC circuits. Direct control functions of the MCS Board include:

1. Interprets and controls serial communications.

2. Controls machine subsystems through the MicroComm interface.
3. Controls the following devices which are not on the MicroComm bus:
   - Processor Drum Motor (speed)
   - Processor Drum (temperature)
   - Optics Translation Motor (speed and direction)
   - Platen Feed Motor
   - Platen Centering Motor
   - Front Door Solenoid
   - Safety interlocks
4. Reads the state of the Optics Home Sensor, Platen Film Sensor and Transport Sensor

6-4-2-1. Master CPU

The Master CPU has general control of all MCS functions. The main resident serial port on the CPU chip is programmed to talk to 4 slave units on the 9-bit Microcom Interface, as described in paragraph 6-3-1. A special feature of the CPU allows the creation of UARTs (Universal Asynchronous Receiver/Transmitters) on its TPU (Time Processing Unit) channels. The integral UARTs allow the CPU to communicate directly with peripherals, saving the expense of an external UART chip. The current configuration of the MCS employs only one TPU UART, which is used to communicate with the IMS.

The CPU works with an Address Decoder FPGA to route Chip Select, control, and addressing signals to other components on the MCS Board. This FPGA extends the CPU's ability to address and control the other components of the MCS.

CPU I/O Port Functions--CPU input and output port functions are defined as follows:

CPU Inputs:

- Optics Home Sensor--Low when optics is in (or past) the home position.
- Platen Sensor--High when film is actuating the sensor.
- Transport Sensor--High when film is actuating the sensor.
- Processor Temp Frequency In--This is a frequency input that is proportional to the processor temperature. It is used to monitor temperature.
- Expose Done--A high pulse at the end of each print.

CPU Outputs:

- Platen On--When low, enables operation of the Platen Nip Stepper Motor.
- Platen Phase 1 and Phase 2--These two channels control direction of the Platen Nip Motor by generating two square waves that are 90 degrees out of phase. Direction depends on which signal leads the other. If Phase 1 leads, the motor turns in the load direction. If Phase 2 leads, the direction is opposite (unload).
- Centering On--When low, turns on the Centering Stepper Motor.
- Centering Phase 1 and Phase 2--These two channels control direction of the Centering Motor by generating two square waves that are 90 degrees out of phase. If Phase 1 leads, the motor operates in the home direction. If phase 2 leads, it operates in the centering direction.
- Vertical On--When low, turns on the Transport Roller Motor.
- Vertical Clk--This is a pulse-width modulated signal that controls the stepping rate of the Transport Roller Motor.

- Kicker On--When low, turns on the Kicker motor.
- Kicker Clk--This is a pulse-width modulated signal that controls the stepping rate of the Kicker Motor.
- Processor Heater Control--Controls the duty cycle of the Processor Heater.
- Translate Clk--This is a pulse-width modulated signal that controls the stepping rate of the Optics Translation Stepper Motor.
- Processor Clk--This is a pulse-width modulated signal that controls the stepping rate of the Processor Stepper Motor.

6-4-2-2. Film Processor Control

The MCS Master CPU and Address Decoder FPGA control the temperature of the Processor heater as follows. A 1,000 ohm RTD is used to sense heater temperature. The RTD output is converted to a frequency modulated signal on the MCS board. This signal, PROC TEMP FREQUENCY IN, is sent to the CPU, where the proper duty cycle for the application of 120 vac heater power is determined. The CPU sends a PROC HEATER CONTROL signal to the Address Decoder FPGA, which generates the PROC SSR DRIVE signal. This pulse-width modulated signal (low-going active) energizes the solid state relay on the Processor Interface Board that routes ac power to the heater.

6-4-2-3. Stepper Motor Drive

Two types of drive circuits are used on the MCS to operate the four stepper motors that are directly controlled by the MCS Board:

Film Centering Stepper and Platen Roller Stepper--Drivers for these motors require an enable signal and two phase signals (square waves) spaced 90 degrees apart. The phase signals determine the direction of current through the motors and the direction of rotation as shown in Table 6-1.

Table 6-1. Stepper Motor Phase/Direction Relationship

Stepper Motor Driver	Leading Phase	Motor Direction
Platen Roller Stepper Motor	Phase 1	Load Direction
	Phase 2	Unload Direction
Film Centering Stepper Motor	Phase 1	Home Direction
	Phase 2	Centering Direction

To start a motor, the CPU configures the phasing channels for the appropriate direction and sends the required enabling signal, PLATEN ON or CENTERING ON (active low). To stop the motor, the enabling signal is driven high. It is not necessary to stop the phasing signals to stop the motor. The Film Centering Stepper Motor is driven at 12 volts dc. The Platen Roller Stepper uses 24 volts dc because it requires high rotational speed and needs higher power to overcome motor winding inductance.

Optics Translation Stepper, Processor Stepper, Vertical Transport Stepper, and Kicker Stepper--The drivers for these 4 motors have microcontrollers that include micro-stepping data tables. The optics translation stepper micro receives input control signals for on/off, direction, and fast or slow speed, as well as clock pulses (TRANSLATE CLK). The other 3 stepper micros have only an on/off control signal, in addition to its clock input , since these 3 motors have only a single direction and speed. Each clock pulse from the CPU to a micro results in one micro step. The micros have different code sets for controlling motor speed:

- In the optics translation code set, there are 16 microsteps per one major step at scanning speed (slow). This corresponds to 3200 microsteps per revolution on a 200 step per revolution motor. Running at high speed, there are approximately 12 microsteps per major step.

- In the code sets for the other drivers, there are 32 microsteps per major step, corresponding to 6400 microsteps per revolution on a 200 step per revolution motor.

6-4-2-4. Media Lookup Table (Linear LUT)

All pixel data passes through this LUT, including the SOS level value from the Pixel Control Register that is applied to the laser during the part of scan rotation just before the laser beam crosses over the SOS Detector. The main function of this LUT is to convert the 12–bit image data to 14 bits. The conversion of digital image data to the output values required by the laser occurred in the DRE Gray Scale Manager software. The Linear LUT output values follow the video level conventions established for earlier laser systems: a digital value of 0 produces a black spot on the film (high laser power). To produce clear areas on the film, large digital values must be presented to the DAC by the LUT, since data inversion occurs at the DAC. The data sense through the system is 0 = black = high laser power.

The data from the LUT is fed to a DAC that converts the 16-bit data to analog to drive the laser diode.

6-4-2-5. Laser Scanning Characteristics

Before describing the circuits on the MCS Board that transfer the image pixels to the laser assembly for printing, it is necessary to briefly consider certain characteristics of the scanning process:

Double Scanning––The laser scanner uses a polygon mirror with two facets. During exposure, each revolution of the polygon causes both Facet 0 and Facet 1 to deflect the laser beam onto the film plane. The **DryView** 8100 exposure engine uses double scanning. Identical pixel data is scanned onto the film from both Facets 0 and 1. Each revolution of the polygon includes four phases:

1. The laser beam reflects off mirror Facet 0 and onto the film surface.
2. The laser beam (if allowed) reflects off the end of the mirror as it turns, scattering light. (As explained in the next paragraph, the potential scattering of light must be cancelled out to avoid generation of image artifacts or increased Dmin.
3. The laser beam reflects off mirror Facet 1 and onto the film surface.
4. The laser beam, if allowed, reflects off the other end of the mirror, scattering light.

Laser Dead Time––Laser dead time is the period when the laser is turned off to avoid the scattering of light off the mirror ends described in the preceding paragraph (phases 2 and 4). The laser is turned back on before the next polygon facet causes the laser beam to cross the SOS detector on the Optics Module Control Board. The length of the dead time is controlled by the Pixel Clock Generator FPGA on the MCS Board. The LASER OFF line from the Pixel Clock Generator turns off the drive circuit from the DAC to the laser for a period determined by a CPU-controlled register in the Pixel Clock Generator.

Pixel Stretch Correction––The two-sided mirror rotates on a motor shaft. If the motor shaft is precisely the same distance from both mirror surfaces, the linear velocity of beams deflected from each mirror will be identical. Since it is impossible to achieve identical distances for the two mirror facets, the laser beams will move at slightly different velocities and, unless corrected, the scan lines from one facet will be longer or shorter than those from the other. The solution to this problem is to stretch one of the lines to make it longer. The line is stretched by occasionally stretching a pixel so that the resulting line is equal in length to the line from the other facet. This stretch parameter is measured during optics manufacturing and stored in the Optics Control Board EEPROM.

6-4-2-6. General Pixel Flow Control Functions

The Pixel Clock Generator and FIFO FPGAs on the MCS Board work together to control the flow of image data from the host to the laser for printing. They perform the following functions, without intervention by the CPU:

1. Synchronize pixel generation with the SOS detector in the Optics Module.
2. Position the image in the vertical direction on the film, under CPU control.
3. Adjust for the nonsymmetric axis of the Spinner Motor mount by varying the length of some pixels on one of the two optics mirror facets. (See **Pixel Stretch Correction** on preceding page.)
4. Turn the laser off during part of each rotation to prevent light scattering as the end of the mirror rotates through the beam axis. (See **Laser Dead Time** on preceding page.)
5. Present the same data for scanning by both optics mirror facets consecutively.
6. Send SOL (Start of Line) signals to the IMS.
7. Accept image data from the IMS in high speed bursts of up to 5 Mpixels per second.
8. Allow simultaneous output of pixel data during these high speed bursts.
9. Do parity checking of the pixel data and generate clearly visible artifacts if an error is detected.
10. Count clocks received from the IMS and written to the page. If the counts do not match the programmed numbers, generate an error detectable by the CPU.
11. Generate a dc SOS (Start of Scan) detection level (settable by the CPU) to trigger the SOS detector for the portion of the scan rotation where the laser beam crosses the SOS detector.
12. Allow access to the Media LUT by the CPU.

6-4-3. Laser Optics Subsystem

6-4-3-1. General

The IMAGER laser optics subsystem includes the following major components:

- A cylindrical platen, on which the film is held motionless during image scanning.
- An optics module, which delivers a scanning laser beam across the surface of the film.
- An optics translation assembly, which translates the laser beam perpendicularly to move down the film, scan line by scan line.

A simplified schematic diagram of the optics is shown in Figure 6-8. The optics module contains a 50 mW solid state laser diode with an emission wavelength of 810 nm. These specifications match the spectral sensitivity of the film used in the IMAGER. The laser beam is modulated by varying its drive current. The laser beam is shaped by collimation and by passing it through a set of three lenses (not shown in diagram) to focus the beam at the film plane. The laser path also contains a beam power attenuator, which controls maximum exposure on the film surface. Basic scanning specifications are as follows:

- Pixel matrix: 4620 by 5596
- Spatial resolution: 12.8 lines per mm
- Laser spot size: 40 um by 60 um
- Power at film: 23.4 mW maximum
- Exposure time 35 seconds

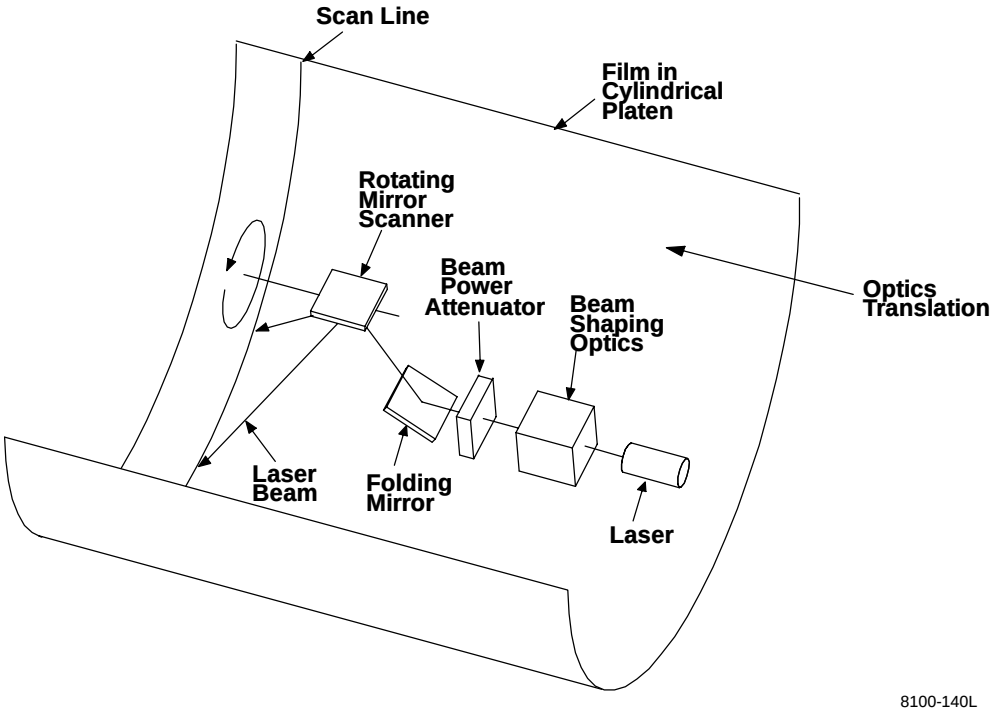


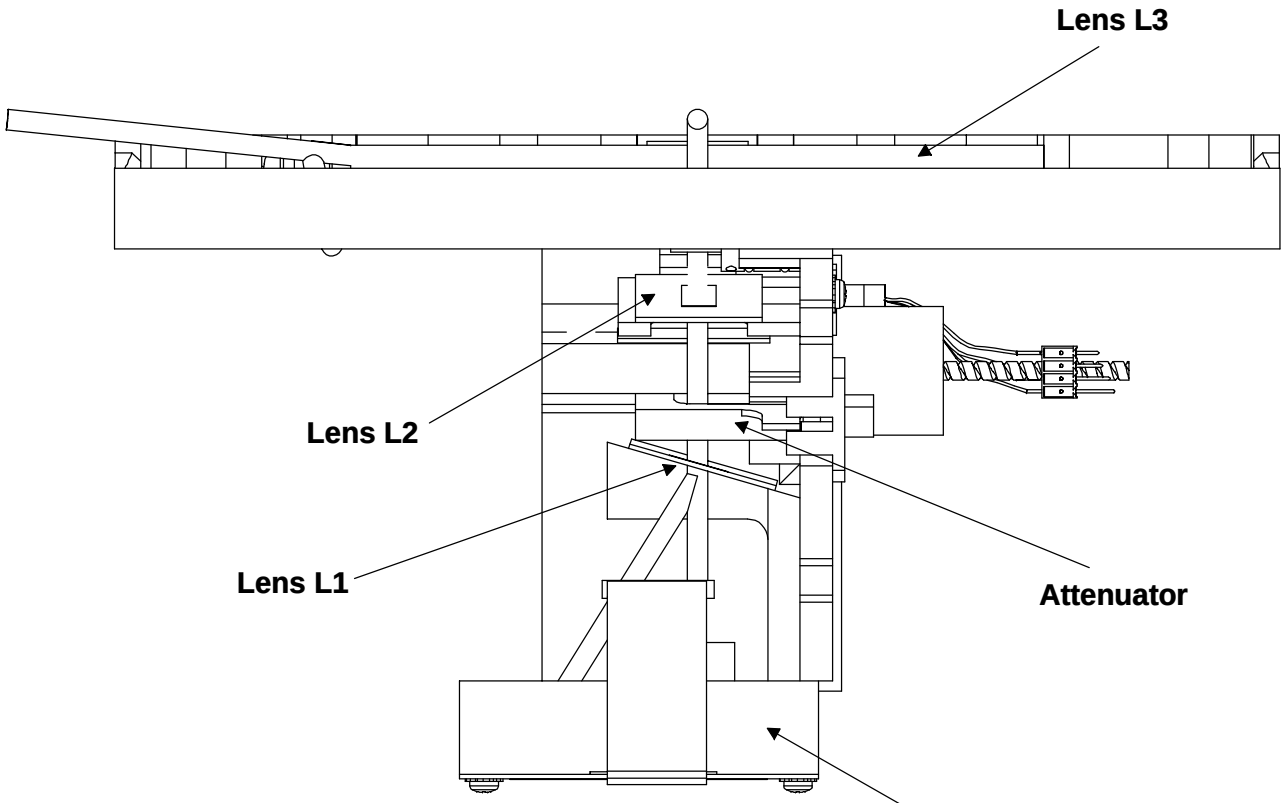
Figure 6-8. Laser Optics - Schematic

6-4-3-2. Film Platen

The optics system of the 8150 IMAGER is an internal drum scanning system, which focuses a scanning laser beam onto the internal surface of a semi-cylindrical drum. Film is held stationary in the platen during imaging. The scanning angle for film in the platen is 180 degrees, covering a nominal distance of 17 inches for line scanning. The optics module is "translated" down the page while scanning occurs, to image the complete page. The nominal travel distance of the optics module at specified translation speed is 14 inches. This method of scanning generates an image on 14 by 17 inch film with the scan line in the vertical (17 inch) direction, as opposed to the typical horizontal direction.

6-4-3-3. Optics Module

Functions of the optics module are described in the following paragraphs. Locations of the optics lenses are shown in Figure 6-9.



Note
Bottom view with Optics Module Drive Board removed.

Figure 6-9. Laser Module - Positions of Lenses and Attenuator

Scanner--The scanner is a 2-sided mirror mounted on an adapter that is installed on the shaft of a dc brushless motor (Spinner Motor DCM3). The two-sided mirror is mounted so precisely on the adapter and motor shaft that the discrepancy in the pointing angle between the two mirrors is insignificantly small. As the motor rotates, the laser beam is reflected downward radially in an approximately conical shape. Flexible lens L3 is placed at half distance between the scanner mirror and the film platen surface. In the *DryView* 8150 IMAGER application, an image line is scanned twice with the same data, once by each of the two sides of the mirror during a single rotation of the motor shaft. Double scanning improves image sharpness, and makes scanning lines invisible under normal viewing conditions.

Pixel Stretch--Despite precise mounting of the two-sided mirror, some radial centering offset of the mirror can occur. This results in a slight difference of velocity between the two mirrors. If a constant pixel clock is used for placing pixels on the film, the scan line length will vary for the two mirrors. To avoid this problem, a variable pixel clock is implemented. For the mirror side that has a lower scanning speed, an extra clock is inserted periodically to lengthen pixel exposure time. This process is called “pixel stretching.”

Scanner Speed Sensing and Control--The Shaft Index optical sensor, triggered by a shiny area on the adapter that secures the two-sided mirror to the Spinner Motor shaft, provides a shaft speed indication to the MCS. At the same time it indicates which mirror is currently scanning. When the speed sense pulse is detected, Mirror 1 is currently scanning.

Scanner speed is controlled by a digital feedback loop on the Optics Module Control Board (OMCB). The time interval between two adjacent scanner speed pulses is measured by a counter using a 16 MHz clock. An error signal determined by the timing measurement is calculated by the microprocessor on the OMBC and sent to the DAC, which feeds a correction voltage to the Spinner Motor.

S**tart of Scan Sensing and Beam Power Monitoring**-- Start of Scan Detector PD1 on the OMCB serves as both SOS detector and laser beam power monitor. The laser is turned off after completion of a scan line, to avoid light scattering. Turn on of the beam is timed so that it will reflect onto PD1 at the beginning of scan, generating the SOS pulse. This pulse is fed back to the MCS Board Pixel Clock Generator to synchronize startup of the pixel clock.

To measure laser power, the laser is turned on constantly at a set driver level, and PD1 performs peak detection for a number of scans. The power value is measured by an A/D Converter to provide a laser power reading.

Laser Driver--The laser driver, housed in the box which contains the laser diode, provides current to run the laser. The current level is determined by the voltage present at the driver input. A feedback loop is formed by reflection of the beam from lens L1 to a photodiode, which feeds a circuit that generates an error signal for feedback control of the driver.

Beam Attenuator--A linearly variable neutral density filter is used to attenuate beam power to accommodate for variations in film speed. Use of the attenuator allows the laser drive current levels to remain independent of film speed variations.

6-4-3-4. Optics Translation Assembly

The optics translation assembly (see Figure 6-10) moves the optics module in the cross-scan direction during exposure. Speed and smoothness of motion must be precisely controlled. Speed variation during translation will result in vertical bands or streaks of nonuniform density on the film image. Also, unstable motion during translation can cause inaccurate placement of pixels, resulting in a variety of image artifacts.

Translation Carriage--The optics module is mounted on a translation carriage that slides on a pair of cylindrical rails during translation. Kinematic support is achieved by a pair of V-shaped bearing surfaces and a flat sliding surface built into the carriage. When the carriage slides on the rails, there is little friction on the carriage in the translation direction, while its position is rigidly determined in the other directions. The cylindrical rails are precision ground to reduce friction. Any marks or scratches on the rails can result in nonuniformity in translation speed.

Drive Mechanism--The carriage is driven by 4 nylon-coated steel cables (called a “quad” cable) mounted on two pulleys: a drive pulley and an idler. The drive pulley is mounted on and coaxial with a circular flywheel. The flywheel is friction-driven by a polyurethane tire mounted on the shaft of Optics Translation Motor (STEP 4).

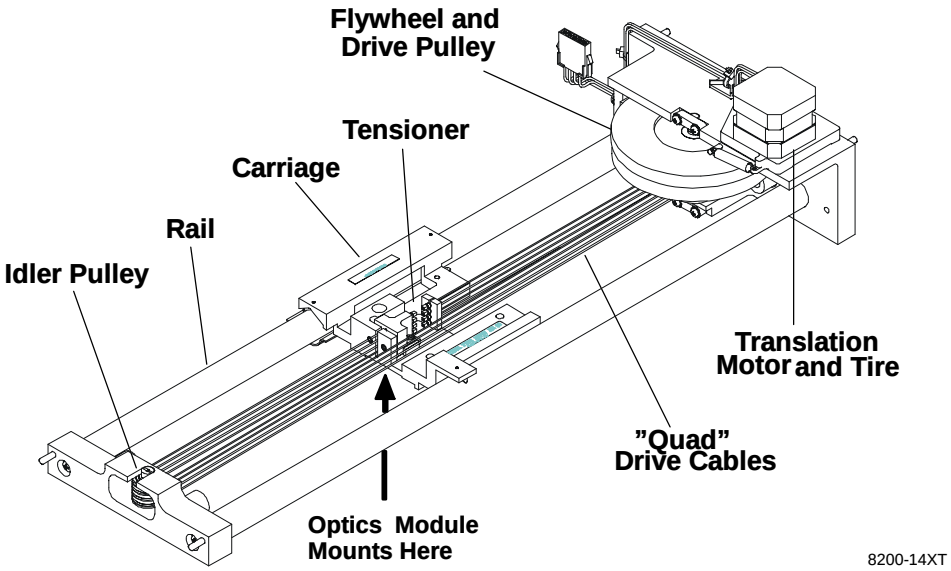


Figure 6-10. Optics Translation Module

6-4-3-5. Optics Module Control Board

This board, located in the laser enclosure, routes the analog drive signal and ± 9 volts dc from the MCS Board to the drive circuits that operate the laser diode (see Sheet 2 of the system diagrams in Section 10). In addition, it contains a slave micro and auxiliary circuits that control the Optics Spinner Motor and Attenuator Motor, and report status to the Master CPU on the MCS Board. It also houses the SOS Detector and Beam Power Monitor circuits.

Parameter EEPROM--The EEPROM for the Slave Micro contains the following information, which is loaded during manufacturing:

- Serial number for the Optics Module, which can be in the range from 0 to 65535.
- Start of Scan (SOS) Delay Time, which can be in the range of 0 to 255 pixels.
- Identification of the polygon mirror facet (0 or 1) to which the pixel stretch value must be applied.
- The value for pixel stretch, in the range of 1500 to 61556.

Note

You can use the SERVICE TOOL to display the EEPROM data: **Diagnostics>MCS>Optics>Display Optics Data**.

Spinner Motor Control--The Spinner Motor scans the laser across the film, as it is reflected successively from the two mirror facets in the double scan process. Turn on and speed of the motor are controlled by the slave micro on the Optics Module Control Board. The speed control signal (SERIAL CLK) from the slave micro is fed to a DAC. The analog output of the DAC is amplified and used as a drive signal for the Spinner Motor.

SOS Detector--During each revolution of the scanner, a photodetector on the Optics Module Control Board is activated by the laser beam reflecting off a spot on the scanner adjacent to mirror Facet 0. Thus Facet 0 is used as the reference for Start of Scan. The SOS signal from the detector, shaped and amplified, is sent to the Pixel Clock Generator on the MCS Board to be used as a timing reference (SOS RAW) for pixel flow control. The detected SOS signal is also used by the Beam Power Monitor on the Optics Module Control Board, as described in the next paragraph.

Beam Power Monitor--The Beam Power Monitor consists of an amplifier and a peak detector that monitor the SOS photodetector. The beam power indication from the peak detector is fed to an AD Converter. The digitized beam power signal is then passed to the slave micro so the information can be used to control attenuation of the laser beam to achieve the desired beam strength during optics calibration.

Optics Module Control Functions--The MCS software implements the following commands to control the optics module:

Reset Optics Electronics Module--This command reinitializes the optics electronics and performs power up tests.

Turn Spinner Motor On--This command turns on the Spinner Motor and controls the rate of rotation precisely.

Turn Spinner Motor Off--This command turns off the Spinner Motor.

Set Attenuator Position--This command moves the attenuator to the position indicated by the position parameter (a value between 0 and 650).

Display Attenuator Position--This command returns a value (between 0 and 650) indicating the position of the attenuator.

Measure Beam Power--This command instructs the optics electronics to activate and reset the beam power monitor, and to turn on the laser long enough for it to spin the laser beam onto the Start of Scan Detector at least three times before reading beam power from the A/D Converter.

Report Beam Power--This command instructs the Optics Module Slave Micro to return measured beam power to the MCS CPU.

Turn Laser On--This command instructs the Optics Module Slave Micro to enable the laser.

Turn Laser Off--This command instructs the Optics Module Slave Micro to disable the laser.

Execute Diagnostics--This command instructs the optics to home the attenuator.

6-4-4. Densitometer Module

The purpose of the Densitometer Module is to read and report film density values from:

- Each step wedge in a calibration film.
- The Dpatch (if used)

The Densitometer Module includes the following components:

- Densitometer/Exit Sensor––This sensor is used to detect the leading and trailing edges of the film to control the timing of density readings. It is used also to detect film jams at the exit of the film processor. The sensor is located about 1 inch ahead of the densitometer emitter and detector in the film path.
- Light Source––This is an LED circuit that is positioned on the opposite side of the film path from a detector on the Densitometer Board. The light from the LED, passing through the film, is detected to provide an indication of the relative density of the image on the film. The LED is turned on, when required, by the Slave Micro on the Densitometer Board.
- Densitometer Board––This board contains a Slave Micro that communicates with the Master Micro on the MCS Board to control density measurement and reporting. In addition to the Slave Micro, it contains a photodetector that reads the light passing through the film, an A/D Converter that converts the analog signal from the detector to digital data, and a PAL that performs timing and logic functions.

6-4-4-1. Step Wedge Calibration

To perform a test calibration, the imager prints a test film that has 19 strips (or steps) of increasing optical density. (See Figures 6-11 through 6-13 for configurations of the calibration sheets for the three sizes of film used in the imager.) The densitometer measures the density of each step and uses the data as feedback to the Automatic Image Quality Control (AIQC) system to create a Film Model (see paragraph 6-3-4-3). Each gray step is preceded by a fiducial consisting of a thin dark stripe followed by a thin light stripe. These are used to locate the start of the next gray step.

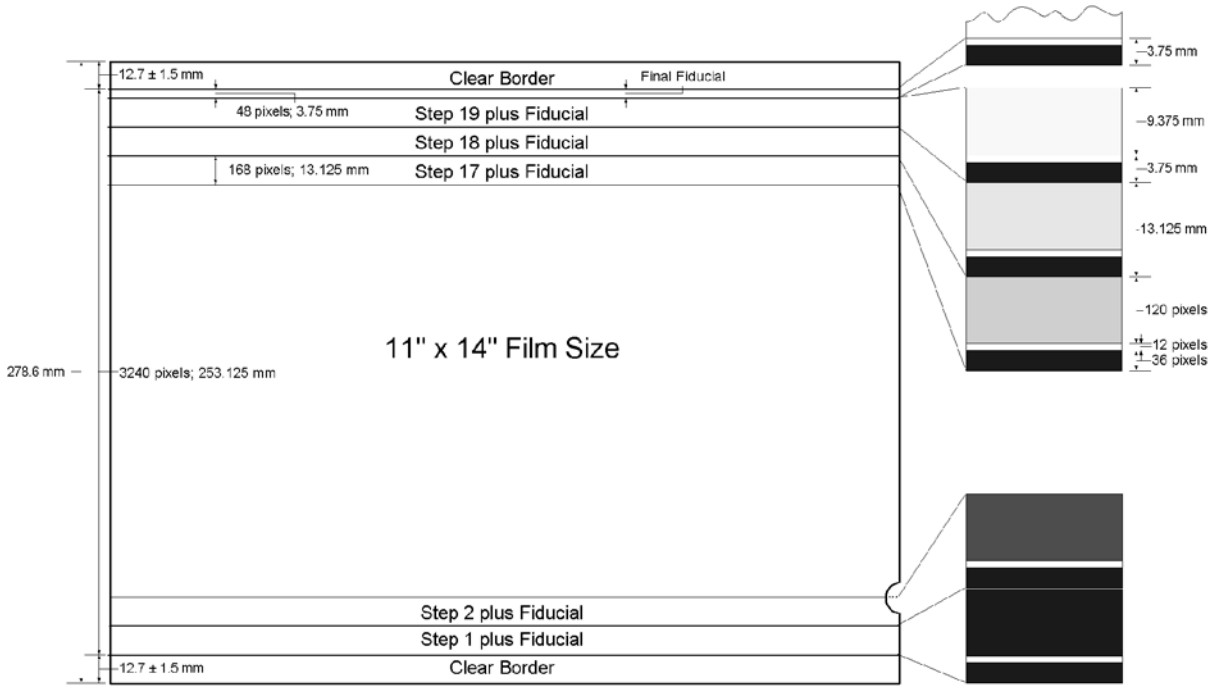


Figure 6-11. 11 by 14 Inch Calibration Sheet

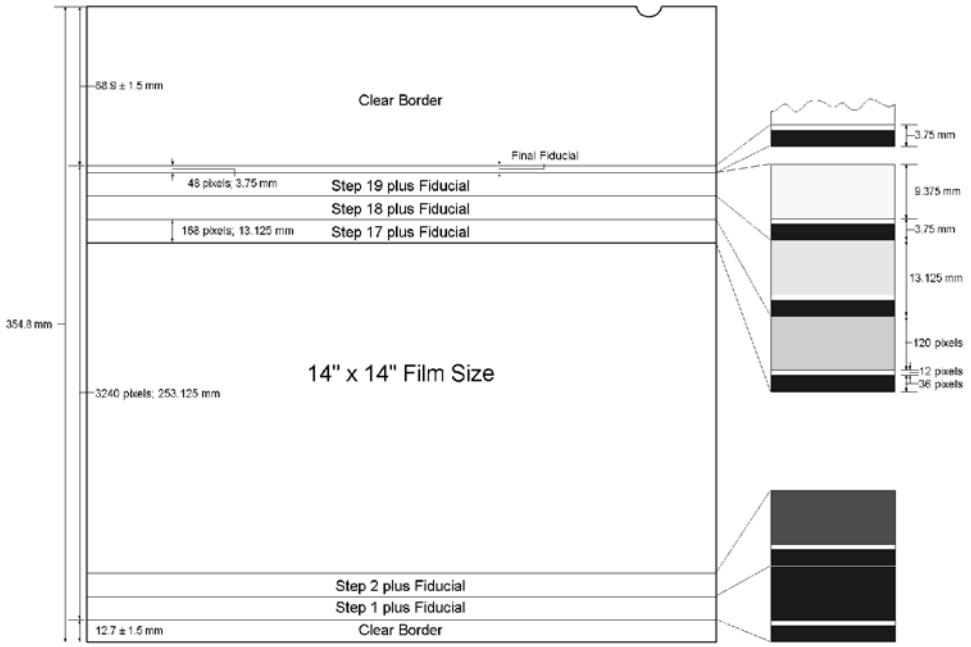


Figure 6-12. 14 by 14 Inch Calibration sheet

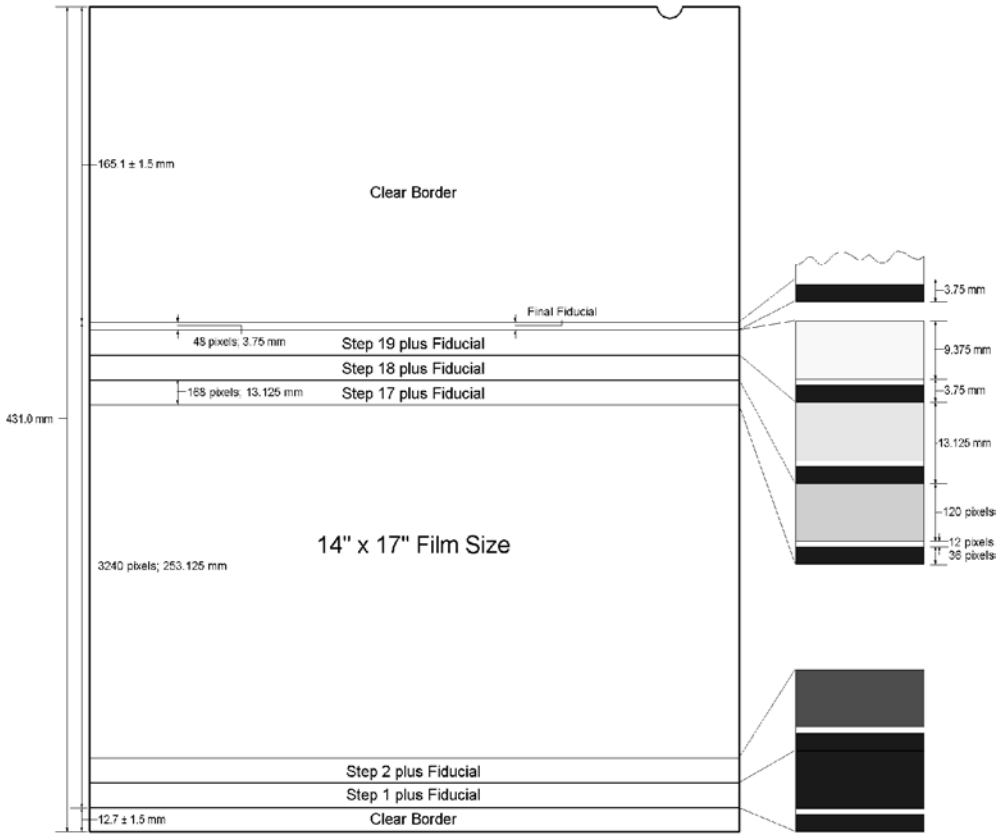


Figure 6-13. 14 by 17 Inch Calibration Sheet

6-4-4-2. Reading the Dpatch

The Dpatch is an option for use only on 14 x 17 inch film. The Dpatch is an area on the sheet of film that is exposed and processed to provide a reference for quality control of optical density. It is a patch of density 1.0 on the top border of the film (see Figure 6-14). The density of the Dpatch is measured to provide feedback to the AIQC system. AIQC then adjusts the optics attenuator as necessary to control the intensity of the laser beam to achieve the target density.

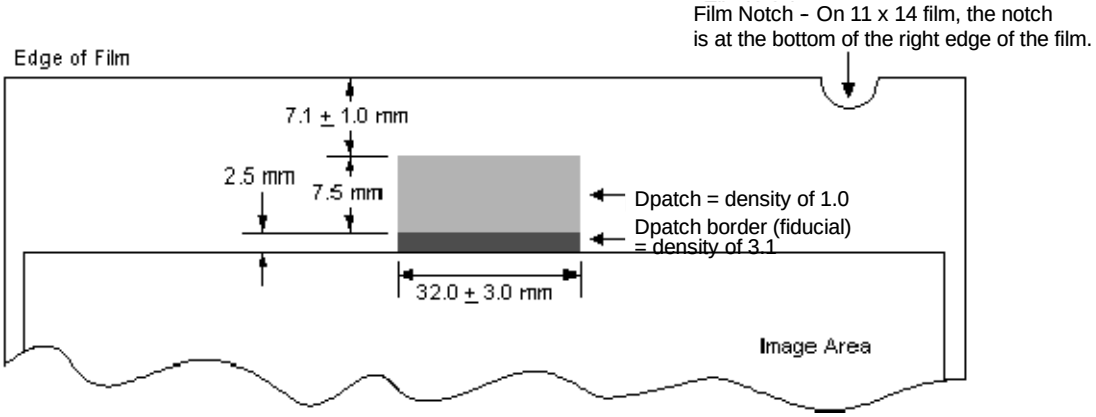

Film Notch - On 11 x 14 film, the notch is at the bottom of the right edge of the film.
Edge of Film
7.1 ± 1.0 mm
2.5 mm
7.5 mm
Dpatch = density of 1.0
Dpatch border (fiducial) = density of 3.1
32.0 ± 3.0 mm
Image Area

Figure 6-14. The Dpatch

6-4-4-3. Using Test Calibration Data to Create the Film Model

Once a successful calibration is achieved, the AIQC system and GSM use the data to create a Film Model and Media Lookup Table, which tell the optics module how much laser attenuation is required to achieve the desired exposure intensity. The data used is a DLogE curve generated by the density values measured over the 19 steps of the gray scale step wedge. A sample DLogE curve is shown in Figure 6-15.

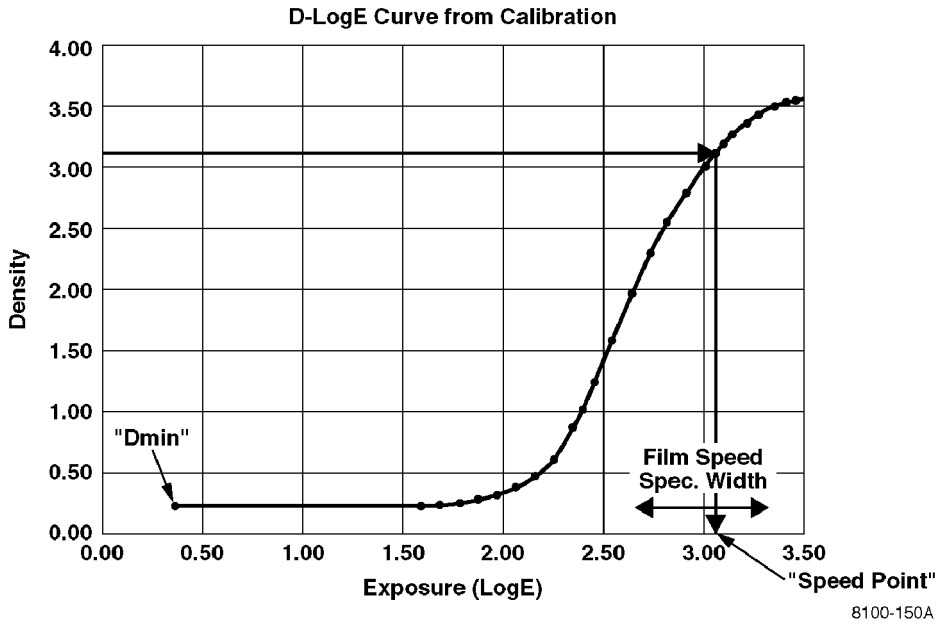


Figure 6-15. Sample Calibration DLogE Curve

6-4-4-4. Densitometer Control Functions

The MCS software that controls densitometer functions implements the following commands:

Reset Densitometer Module––This command reinitializes the A/D converter and resets its counters and flags.

Arm for Dpatch––This command:

- Monitors the Exit Sensor to detect the leading and trailing edges of the film.
- Calculates the average density from the raw readings and reports the results to MPC and Gray Scale Manager (GSM) logs.

Report Dpatch Value––This command reports the calculated average density value.

Arm for Step Wedge––This command:

- Monitors the Exit Sensor to detect the leading and trailing edges of the film.
- Calculates the average density from the raw readings.

Report Step Wedge Value––This command reports the calculated average density of the step.

Execute Diagnostics––This command:

- Reads the densitometer with the light source off and sets the dark offset to the raw value.
- Reads the densitometer with the light source on and sets the light offset.
- Compares the dark and light offsets. If the difference between the two values is insufficient, sets the Densitometer Failure Error bit.
- Reads the Exit Sensor every 3 seconds and reports status.

Read Raw Densitometer Value––This command reads the current raw value form the A/D Converter every 16 ms and reports status on request.

Turn Light Source On––Turns the light source on.

Turn Light Source Off––Turns the light source off.

6-4-5. RF TAG SUBSYSTEMS

The RF TAG SUBSYSTEM installed on the ROLLBACK MODULE reads cartridge ID information from the RF TAG on the bottom of the FILM CARTRIDGE and reports it to the MCS. It can also write data from the MCS onto the RF TAG. Each TAG contains space for 2K bits of data , which are divided into 62 blocks of 4 bytes each (with 64 bits remaining for special use). Blocks 0 - 4 (bits 0 - 159) contain the following information, sent from the factory with the FILM CARTRIDGE:

- A TAG ID
- 5 bytes of TAG “details” indicating the number of blocks on the TAG and the number of bytes per block
- The number of sheets of film in the CARTRIDGE. (This number is decremented by the IMAGER as film is used.)

The remaining blocks (5 - 62) on the TAG are used to store the following data, written to the TAG by the IMAGER:

- Model and serial numbers of the IMAGER
- Print count
- MCS FIRMWARE version number

- Film size, type, and grade
- Date the information from the iMAGER was communicated
- Calibration information, including source of calibration request and laser dynamic range
- Error information

6-4-5-1. RF TAG SUBSYSTEM COMPONENTS

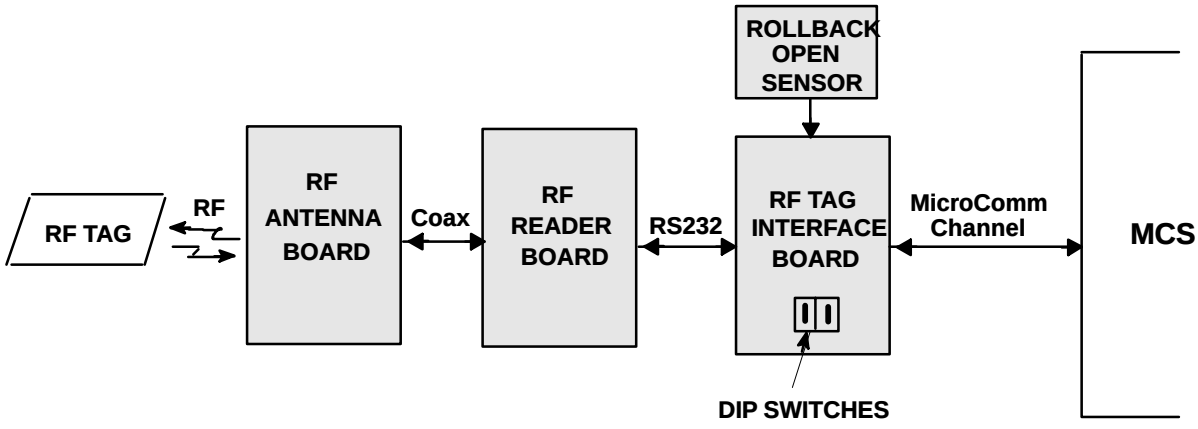
The RF TAG SUBSYSTEM includes the following components (see illustration below):

Note

For a more detailed illustration of the RF TAG SUBSYSTEMS, see sheet 2 of the 8150 Functional Diagrams. (Functional Diagrams are on the *Kodak* Health Imaging Digital Output Service Collection CD set.)

- **RF TAG INTERFACE BOARD** – This BOARD contains a micro which communicates (at 512 K baud) with the MCS on the MicroComm serial channel. The micro builds commands which can be recognized by the RF READER BOARD, and sends these through a circuit which converts the VCC (or /TTL) levels to ± 8 volt RS232 levels. The commands are sent at 67.4 K baud to the READER BOARD. Data received from the READER BOARD goes through a reverse conversion process before being input to the micro.

  The RF TAG INTERFACE BOARD contains a pair of DIP SWITCHES. The left SWITCH, which is normally open (down), can be closed to test the ROLLBACK OPEN SENSOR. The right SWITCH, which is normally down in the 8150 IMAGER, is used in 8200 IMAGERS to identify the position of the ROLLBACK MODULE as upper or lower.
- **RF READER BOARD** – This BOARD receives commands from the RF TAG INTERFACE BOARD. It processes data for transmission to the RF ANTENNA, receives RF data from the ANTENNA, and responds to the RF TAG INTERFACE BOARD.
- **RF ANTENNA BOARD** – The ANTENNA transmits to and receives RF energy from the RF TAG.
- **ROLLBACK OPEN SENSOR S13** – This SENSOR conducts (high output) whenever it is not blocked by the VANE on the bottom of the ROLLBACK CARRIAGE. When the CARTRIDGE LID is fully opened (rolled back), the VANE blocks the SENSOR and it turns off.



6-4-5-2. RF TAG Commands

The MICRO on the RF TAG INTERFACE BOARD receives and processes the following commands from the MCS:

- Report Status
- Reset Software
- Execute Diagnostics
- Report Firmware Version Number (i.e., the micro firmware on the RF Tag Interface Board)
- Read the ROLLBACK OPEN SENSOR
- Read a Block of Data from the TAG
- Write a Block of Data to the TAG
- Lock a Block on the TAG (i.e., do not allow writing to the block)
- Read the RF TAG ID
- Read the RF TAG Details (i.e., read information about the number of blocks, bytes per block, etc.)
- Read the Version Number of the RF READER BOARD

6-4-6. Feeder Control Board

The Feeder Control Board is responsible for extracting film from the film cartridge and feeding it to the platen. The board contains, in addition to a slave CPU, drive circuits for three dc motors and two stepper motors. The Slave CPU receives inputs from eight optical sensors that provide position information relating to mechanical components that handle film. Timing for all feeder control functions is controlled by the Slave CPU.

6-4-6-1. Motor Control

The Feeder Control Board controls the following 5 motors:

- The Elevator (Stepper) motor, which raises and lowers the film cartridge in the rollback tray.
- The Rollback (DC) Motor, which rolls the cartridge lid open or closed.
- The Pickup (DC) Motor, which moves the pickup cups up and down.
- The Feed Roller Open (DC) Motor, which opens and closes the film feed rollers to capture the film positioned by the pickup cups.
- The Feed Roller (Stepper) Motor, which drives the film from the cartridge to the platen rollers.

DC Motor Drive––The 3 identical bidirectional dc motors operate on +12 volts dc. The drivers for the motors do not provide current limiting. When the motors are turned on, they are essentially placed across the +12 volt dc supply. The only control applied to the motors, aside from turning them off and on, is in the direction of current flow through the motor windings. Each motor driver has 2 control lines coming to it from the Slave CPU. When these lines are at opposite digital levels, the motor is energized. When the lines are at the same level, the motor is off. The polarity of the signals applied to the 2 control lines determines the direction of travel.

Stepper Motor Drive––The drive circuits for the 2 stepper motors are identical to the stepper drive circuits on the MCS Board for the Film Centering and Platen Motor Stepper Motors. Each driver requires from the CPU an enable signal and 2 phase signals (square waves) spaced 90 degrees apart. The lead/lag relationship of the phase signals determines the direction of current flow through the motor windings and thus the direction of motor rotation. To start a motor, the Slave CPU configures the phasing channels for the appropriate direction and sends the required enabling signal, NIP PHASE ON or ELEVATOR PHASE ON (active low). To stop the motor, the enabling signal is driven high. It is not necessary to stop the phasing signals to stop the motor. The Elevator Stepper Motor is driven at +12 volts dc, and the Feed Roller Stepper is driven at +24 volts dc.

6-4-6-2. Sensor Control

The Feeder Control Board receives status from the following 8 sensors:

- Pickup Position Sensor, which indicates that the pickup arm is in its home (top) position.
- Film Surface Sensor, which signals that the pickup arm has moved to the position where the sensor contacts the film surface.
- Film Out Sensor, which indicates (after the pickup arm has moved down) whether the cartridge is out of film.
- Cups Engaged Sensor, which indicates that the suction cups have rotated down to engage the film.
- Feed Roller Open Sensor, which indicates whether the feed rollers are open or closed.
- Cartridge Present Sensor, which indicates that a film cartridge is loaded.
- Rollback Home Sensor, which indicates that the film cartridge is closed.
- Elevator Home Sensor, which indicates that the elevator is in the home (lowered) position.

All 8 sensors are identical electronically and have the same pinout configuration. Since the sensors are the infrared type, and thus have the potential of exposing film, the Slave CPU switches them off and on as needed by means of the SENSOR CONTROL line. When this line is low, the sensors are off. To read sensor status, the CPU sets the line high, providing a ground for the sensor circuits through Q1. All the sensors operate with the same “sense”: When a sensor is blocked (i.e., no light is reaching the detector side), the output of the sensor is a logic 0 (low).

As shown on sheet 2 of the 8150 Functional Diagrams, the Feeder Control Board contains 2 jumper plugs for use by a service technician. (Functional Diagrams are on the *Kodak* Health Imaging Digital Output Service Collection CD set.)

The jumper on plug JP3 will provide a “full time” ground for the sensor circuits if placed in the SENSORS ON position (bypassing CPU control). Also, the jumper on plug JP2 can be used to activate the 8 LEDs on the board for troubleshooting purposes. Each sensor input line to the CPU includes an LED. When a particular sensor is blocked (not conducting), its corresponding LED will turn on if jumper JP3 is in the SENSORS ON position.

Note

Following service use, the jumpers must be removed from the service position and stored in the “normal” position on the jumper plugs, for normal machine operation.

6-4-6-3. Film Pickup and Feed Functions

The MCS software that controls film pickup and feed through the MicroComm interface implements the following commands:

Start Pickup--This command initiates the following sequence:

1. Check the following items before moving the pickup arm:
   - The pickup arm is home (Pickup Position Sensor).
   - Pickup and feed diagnostics have passed.
   - No other operations are in process.
   - A film cartridge is present (Cartridge Present Sensor)
   - The cartridge has been rolled back (Rollback Home Sensor).
   - The cartridge elevator is lowered (Elevator Home Sensor).

2. Lower the pickup arm until it contacts the film (Film Surface Sensor).
3. Determine whether film is present in the cartridge (Film Out Sensor). If it is not: recheck twice to confirm, then return the pickup arm home and report the error.

Note

If an error occurs at any point during the pickup sequence, the pickup arm is stopped and returned home. Then the error is reported to the MCS.

4. If film is present, continue moving the pickup arm until the pickup suction cups contact the film (Cups Engaged Sensor). Then apply suction cup vacuum.
5. Reverse pickup arm direction and move the pickup arm to the film separation tabs position (timed function).
6. Pause 1 second. Then pat down the film by lowering the pickup arm to the film surface. After patdown, return the pickup arm to the separation tabs position and pause for 1 second.
7. Move the pickup arm up to the feed nip roller position (Pickup Position Sensor) and stop.
8. Close the feed nip rollers onto the film.
9. Release the suction cup vacuum and return the pickup arm to the home position (Pickup Position Sensor).
10. Report to the MCS that film is ready to feed.

Stop Pickup--This command stops the Pickup Motor and reports status to the MCS.

Start Feed--This command starts the Feed Roller Motor and reports status to the MCS.

Stop Feed--This command stops the Feed Roller Motor, returns the feed nip roller to the open position, and reports status to the MCS.

Home the Pickup Arm--This command:

1. Moves the pickup arm off the home position, if it is home.
2. Moves the pickup arm back home (Pickup Position Sensor).
3. Reports status to the MCS.

Home the Feed Nip Rollers--This command:

1. Moves the feed nip rollers toward the closed position until the Feed Roller Open Sensor is activated or until a preset timeout.
2. Moves the rollers toward the home position until the Feed Roller Open Sensor deactivates.
3. Reports status to the MCS.

Diagnostics--The diagnostics for the pickup and feed functions exercize essentially all the commands described above.

6-4-6-4. Cartridge Elevator Functions

The MCS software uses the following commands to control cartridge elevation:

Raise Cartridge--This command:

1. Checks the following before moving the elevator (via the Elevator Motor):
   - The pickup arm is home (Pickup Position Sensor).
   - The cartridge is closed (Rollback Home Sensor), if a cartridge is loaded.

2. Starts the Elevator Motor, moving the cartridge up for a preset time, then stops the motor.
3. Reports status to the MCS.

Lower Cartridge--This command:

1. Rotates the rollback mechanism (Rollback Motor) 360 degrees or until the Rollback Home Sensor activates.
2. Starts the Elevator Motor, moving the cartridge down for a preset time, then stops the motor. (The Elevator Home Sensor is checked to see if the elevator lowered to the proper position.)
3. Reports status to the MCS.

Stop Elevator--This command stops the Elevator Motor and reports status to the MCS.

Diagnostics--The elevator diagnostics move the elevator off the home position (if it is home), return it home, and then report status to the MCS.

6-4-6-5. Cartridge Rollback Functions

The MCS software uses the following cartridge rollback commands:

Open Cartridge--This command:

1. Checks the following before starting the Rollback Motor:
   - The pickup arm is home (Pickup Position Sensor).
   - A cartridge is loaded (Cartridge Present Sensor).
   - The elevator is home (Elevator Position Sensor).
2. Starts the Rollback Motor to roll back (open) the cover for a preset time, then stops the motor.
3. Reports status to the MCS.

Close Cartridge--This command starts the Rollback Motor to close the cover for a preset time, then stops the motor.

Stop Rollback--This command stops the Rollback Motor and reports status to the MCS.

Diagnostics--The rollback diagnostics move the rollback mechanism off home (if it is home), return it home, and then report status to the MCS.

6-4-7. Processor Interface Board

The Processor Interface Board controls application of 120 volt ac power to the processor heater. It is part of a control loop that includes (1) the Processor RTD, which senses the current temperature of the processor, (2) a Voltage to Frequency Converter, which converts the analog signal from the RTD to a digital frequency- modulated signal, and (3) the Master CPU, which calculates the power-on duty cycle required to keep the heater at the required temperature. The primary components of the Processor Interface Board are 2 relays:

- Relay K2--When power is applied to theIMAGER and the top hood is closed, this relay is energized and applies the Line (hot) side of 120 volts ac to the Load 1 terminal of Relay K1. (The neutral line of 120 vac is applied directly to one side of the processor heater.)
- Solid State Relay K1--This relay is controlled by the PROC SSR DRIVE signal from the MCS Board. This pulse width modulated signal provides a low (ground) that actuates the solid state relay for duty cycles controlled by the Master CPU on the MCS Board. When the relay is actuated, 120 vac is applied to the processor heater via the Load 2 terminal of the relay. LED1 lights when the solid state relay is energized.

6-4-8. DC Power Supply

The DC Power Supply receives 120 volts ac from the secondary of Power Transformer T1 when Circuit Breaker CB1 and the Power Switch are closed. The power supply provides the following outputs to the MCS Board, which distributes dc power to the remainder of the MCS.

- +24 volts ± 5 %
- +12 volts ± 5 %
- -12 volts ± 5 %
- +5 volts (VCC) ± 5 %

The Service Switch and interlocks on the front door, rear panel, and top hood can interrupt +12 volt and/or +24 volt dc power to certain circuits, as shown on sheet 2 of the functional diagrams in Section 10.

6-4-9. MCS Print Sequence of Operation

The MCS is involved in six basic operations in the normal course of printing a sheet of film. These, described in Figure 6-16, are the following:

- Power up and self-test. (For details of the process, see Figures 7-1 through 7-7 in the Troubleshooting section of this manual.)
- Pick up film. (See Figure 6-17.)
- Load the exposure platen (See Figure 6-18.)
- Expose the film (See Figure 6-19.)
- Unload the platen (See Figure 6-20.)
- Process the film (See Figure 6-21.)

In addition to the basic printing operations, the folloiwng operations are flowcharted:

- Front door close (See Figure 6-22.)
- Front door open (See Figure 6-23.)
- RF Tag Sequence at Cartridge Opening (See Figure 6-24.)
- RF Tag Write and Calibration Count (See Figure 6-25.)

Note

Dotted lines between components on the flowcharts indicate that the function is a MicroComm subsystem operation.

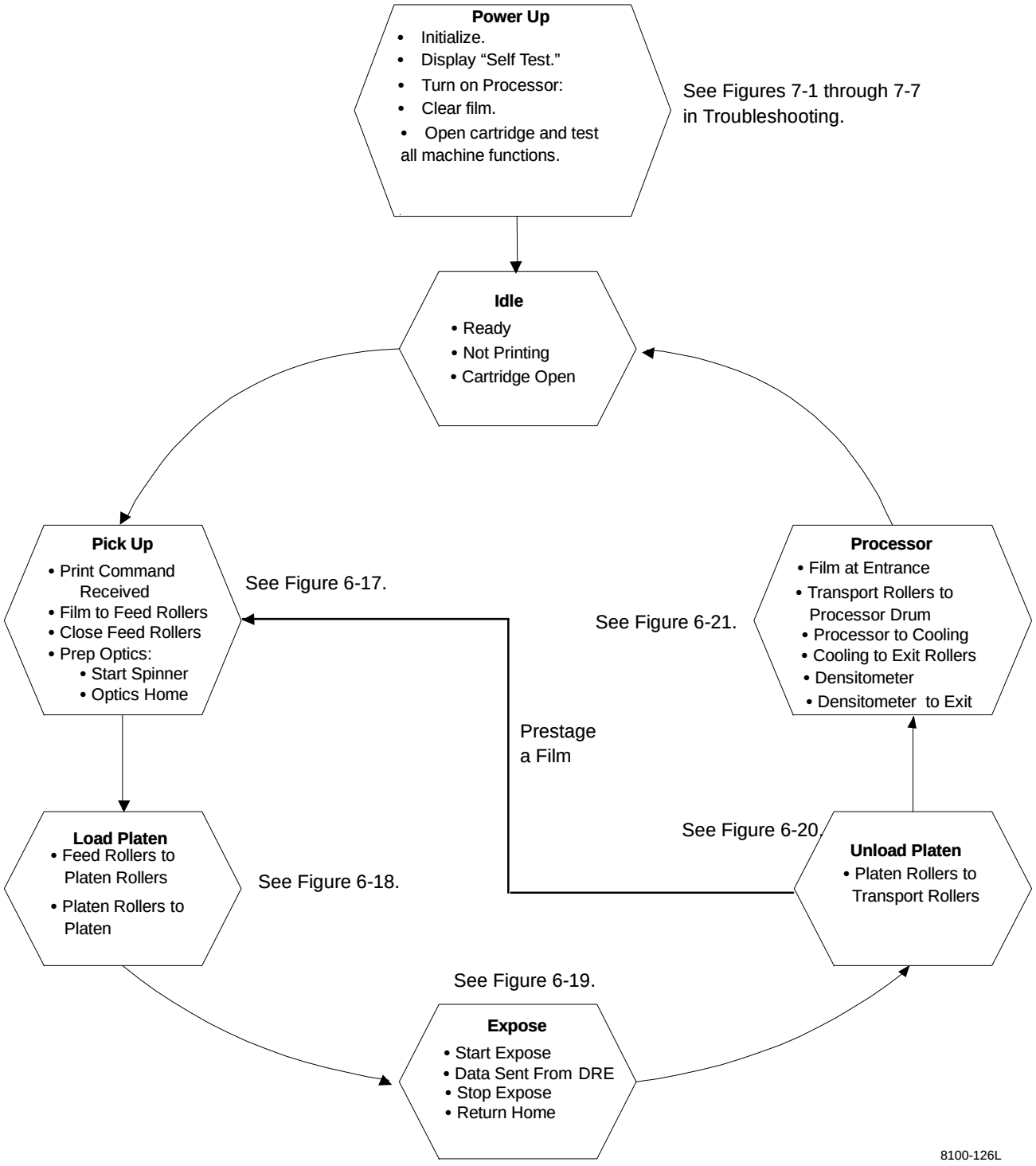


Figure 6-16. MCS Basic Operations

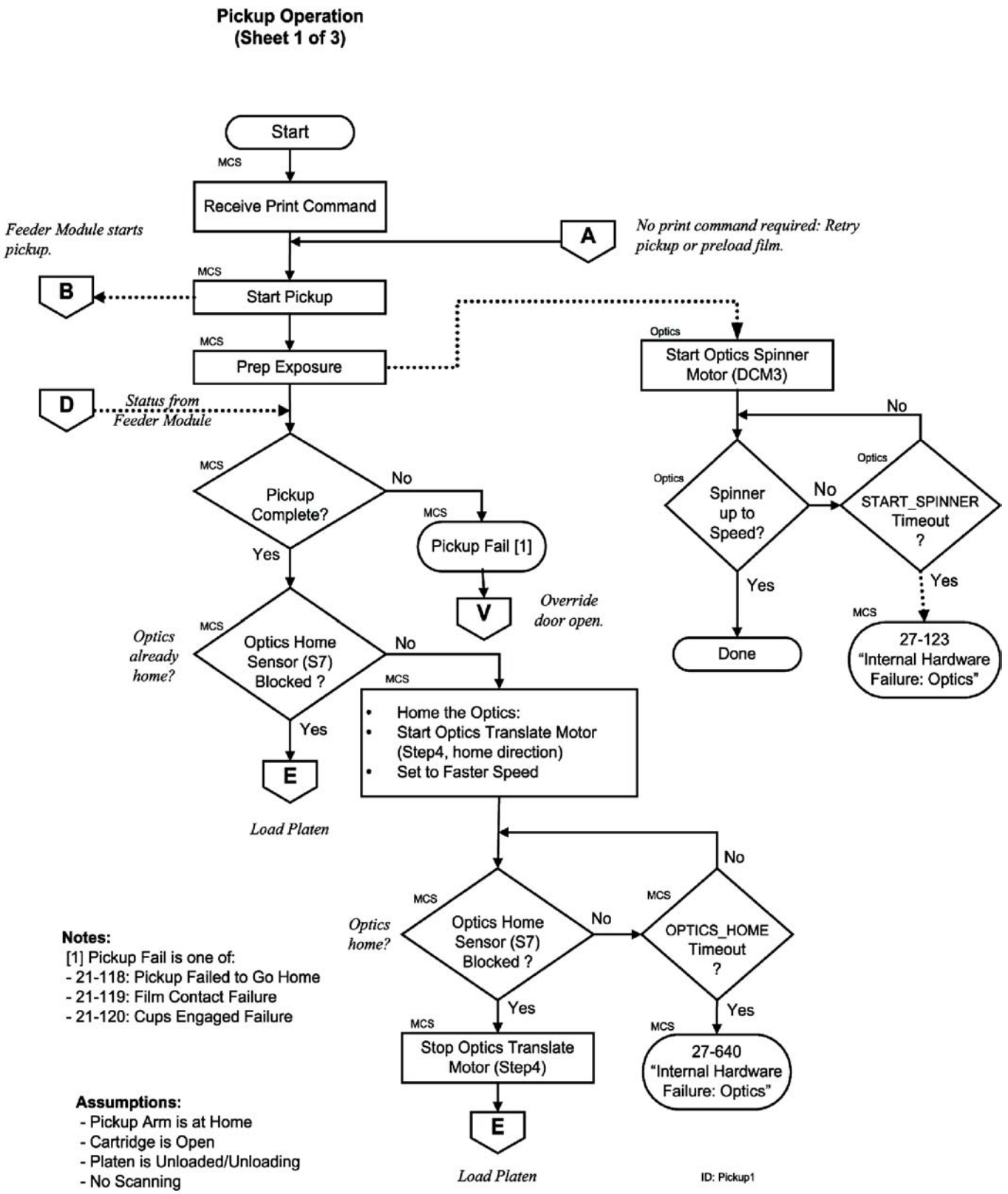


Figure 6-17. Pickup Operation (Sheet 1 of 3)

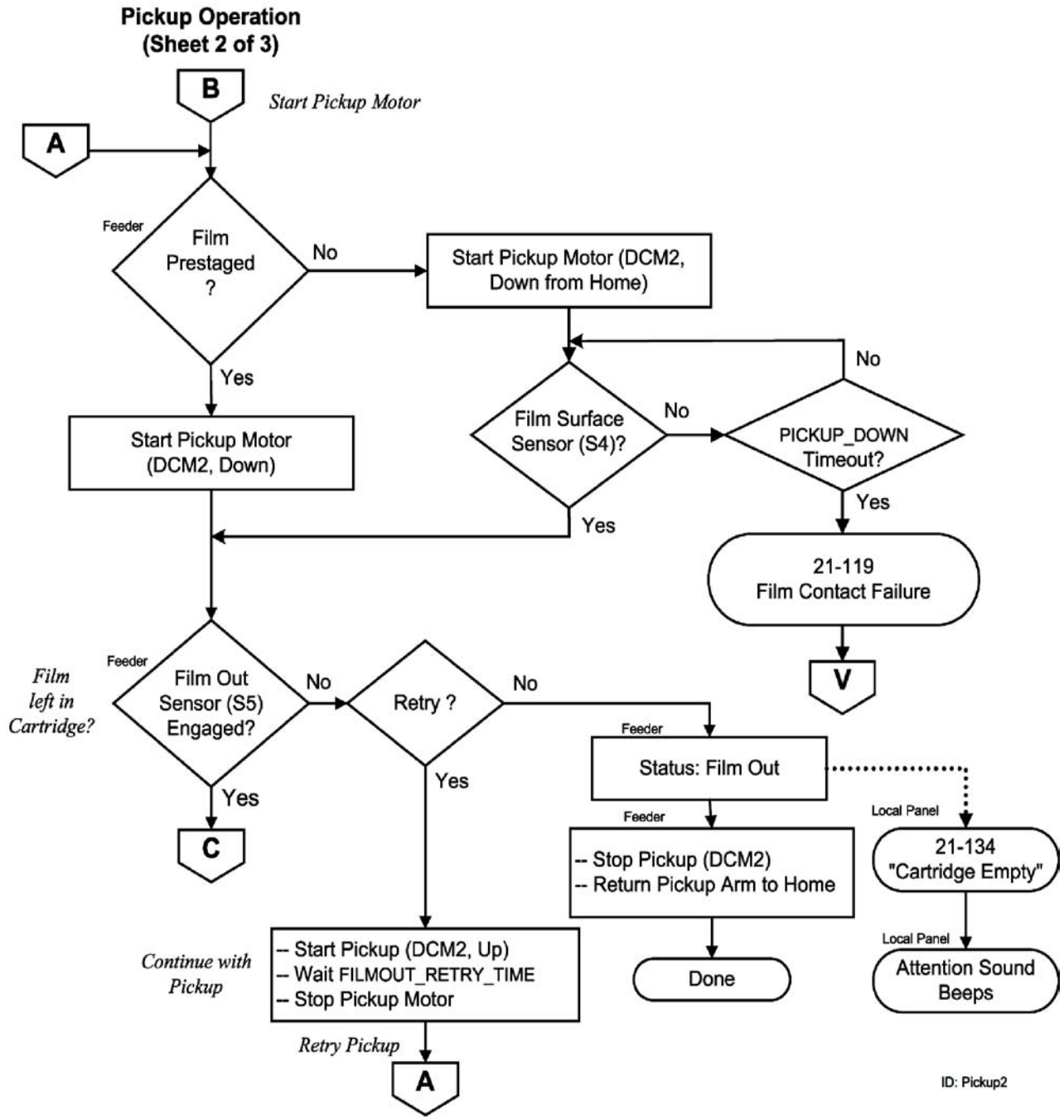


Figure 6-17. Pickup Operation (Sheet 2 of 3)

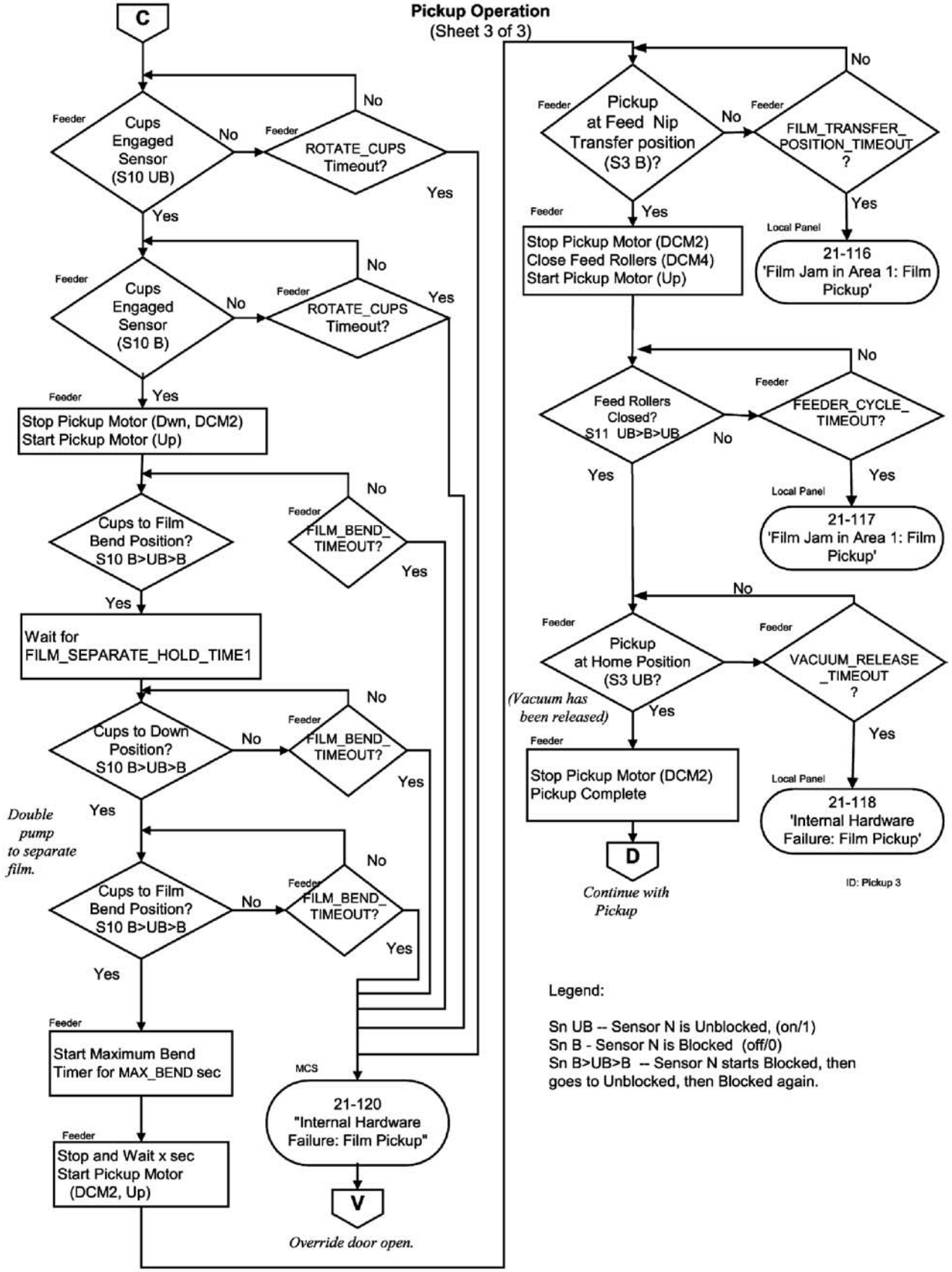


Figure 6-17. Pickup Operation (Sheet 3 of 3)

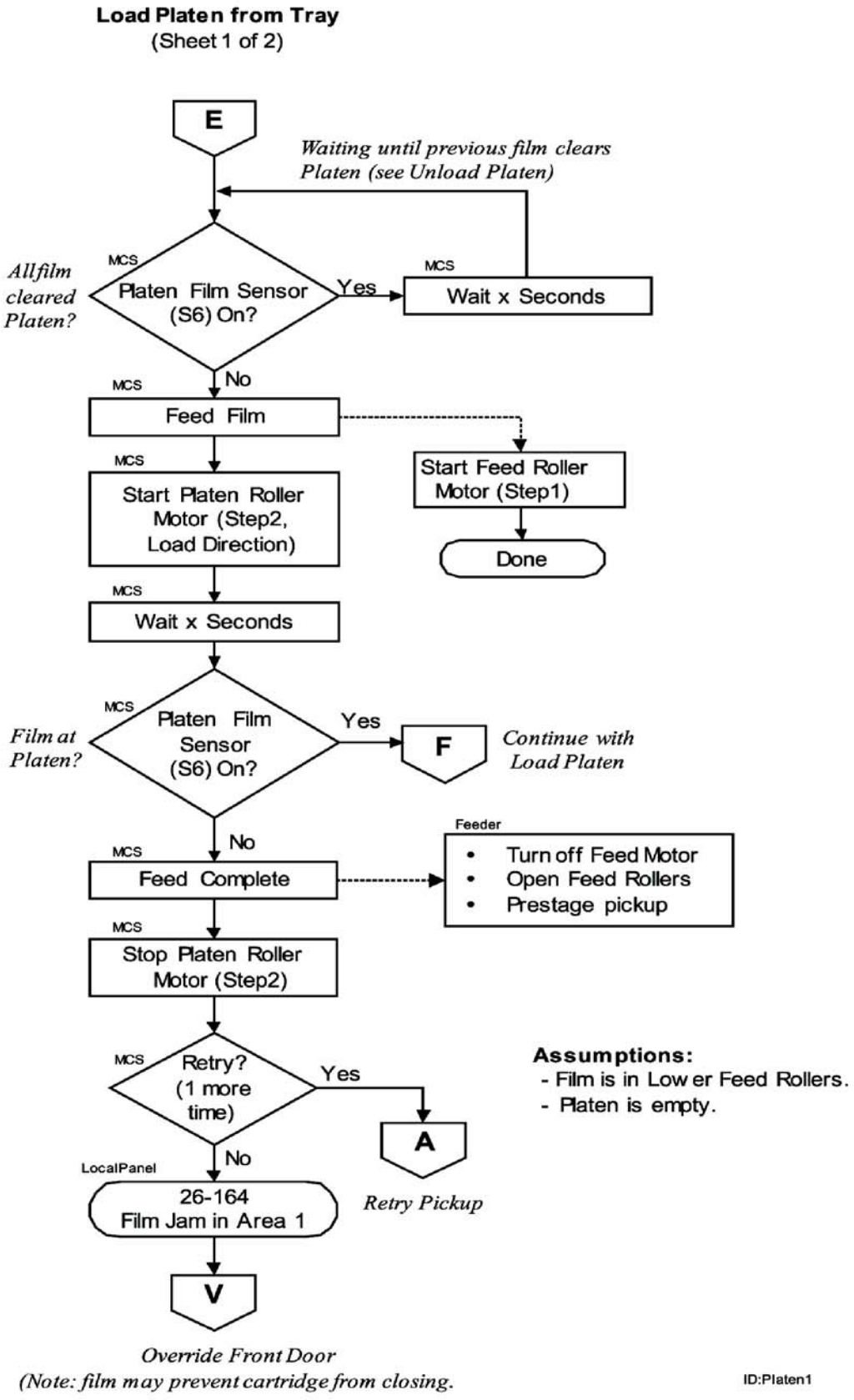


Figure 6-18. Load Platen Operation (Sheet 1 of 2)

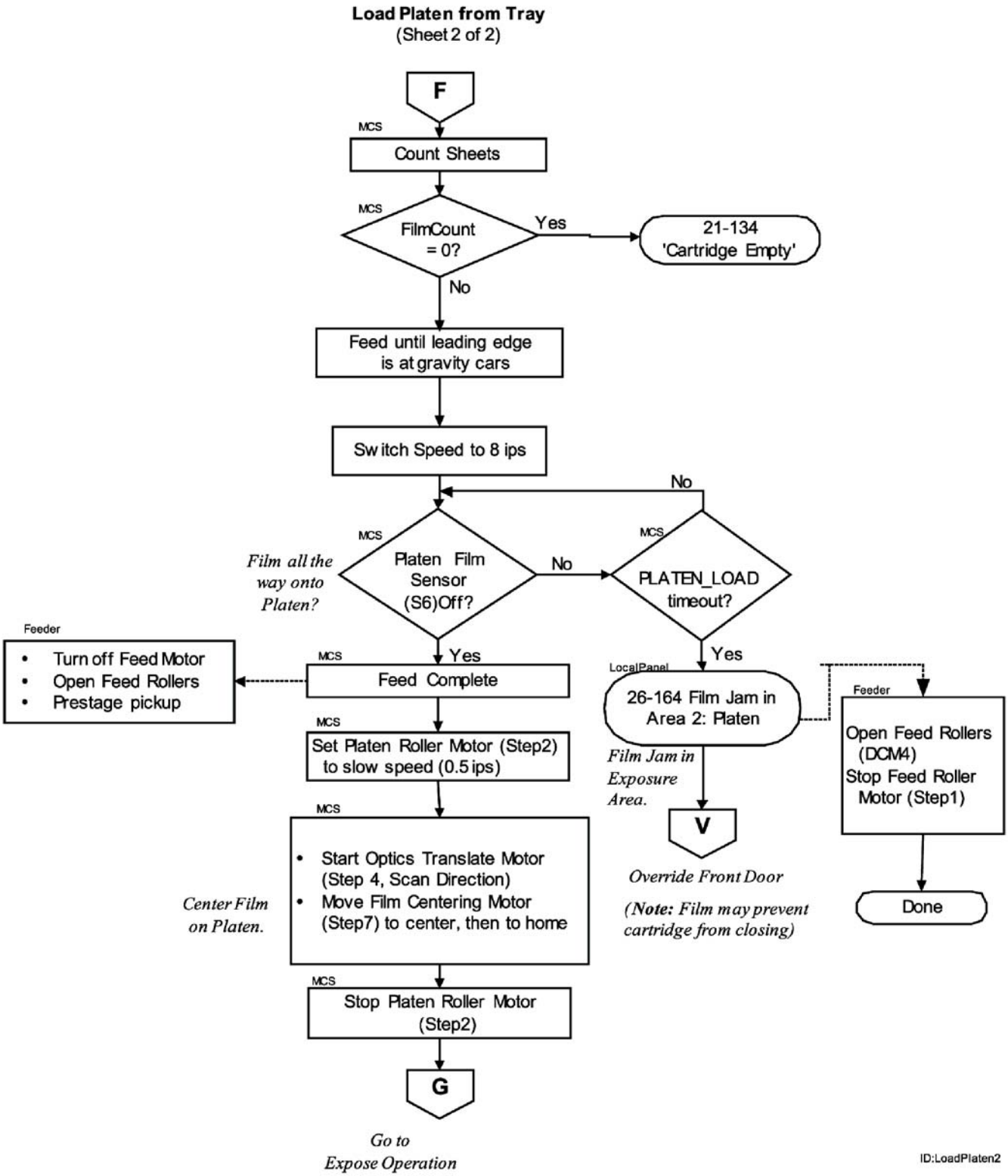


Figure 6-18. Load Platen Operation (Sheet 2 of 2)

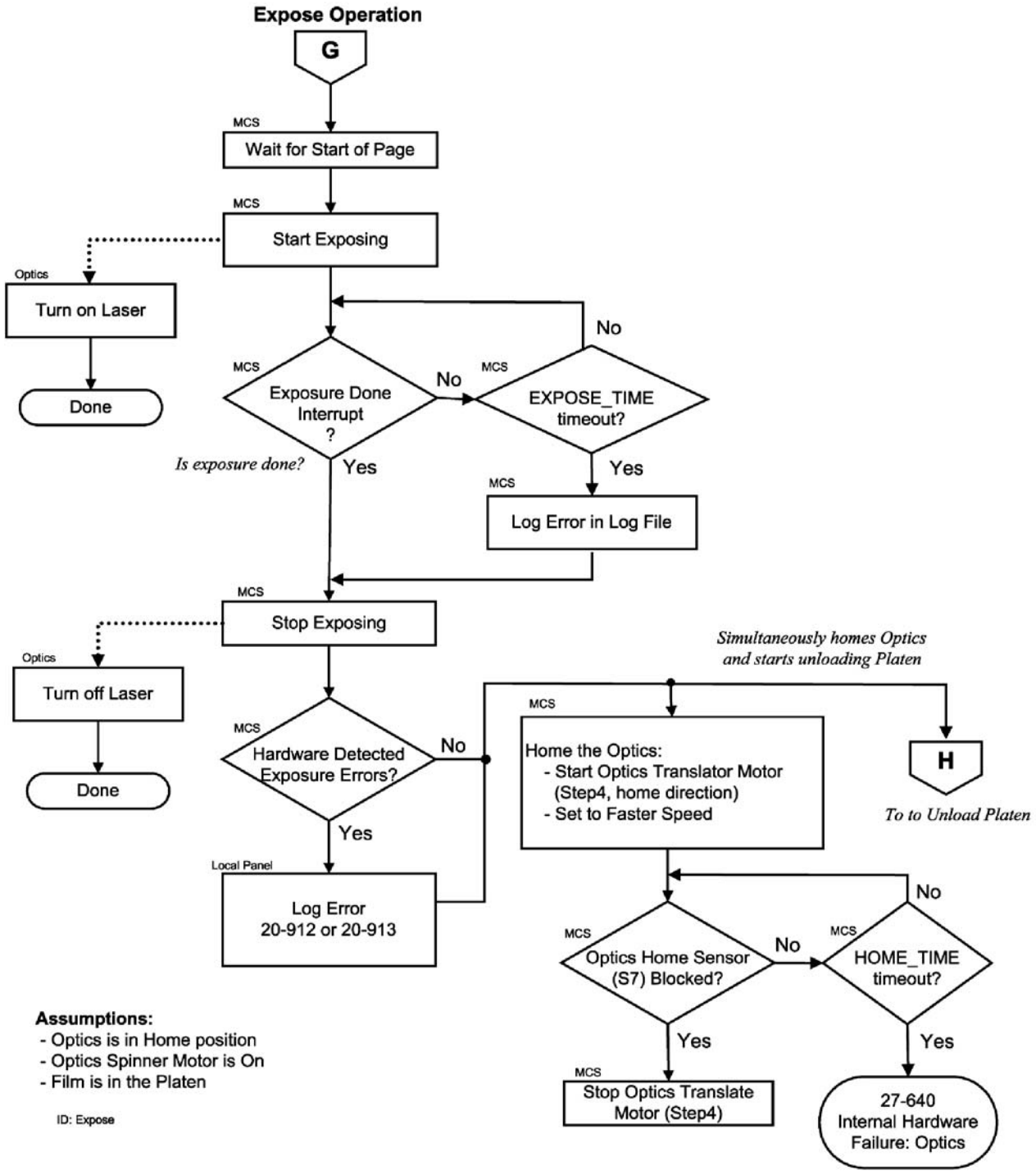


Figure 6-19. Expose Operation

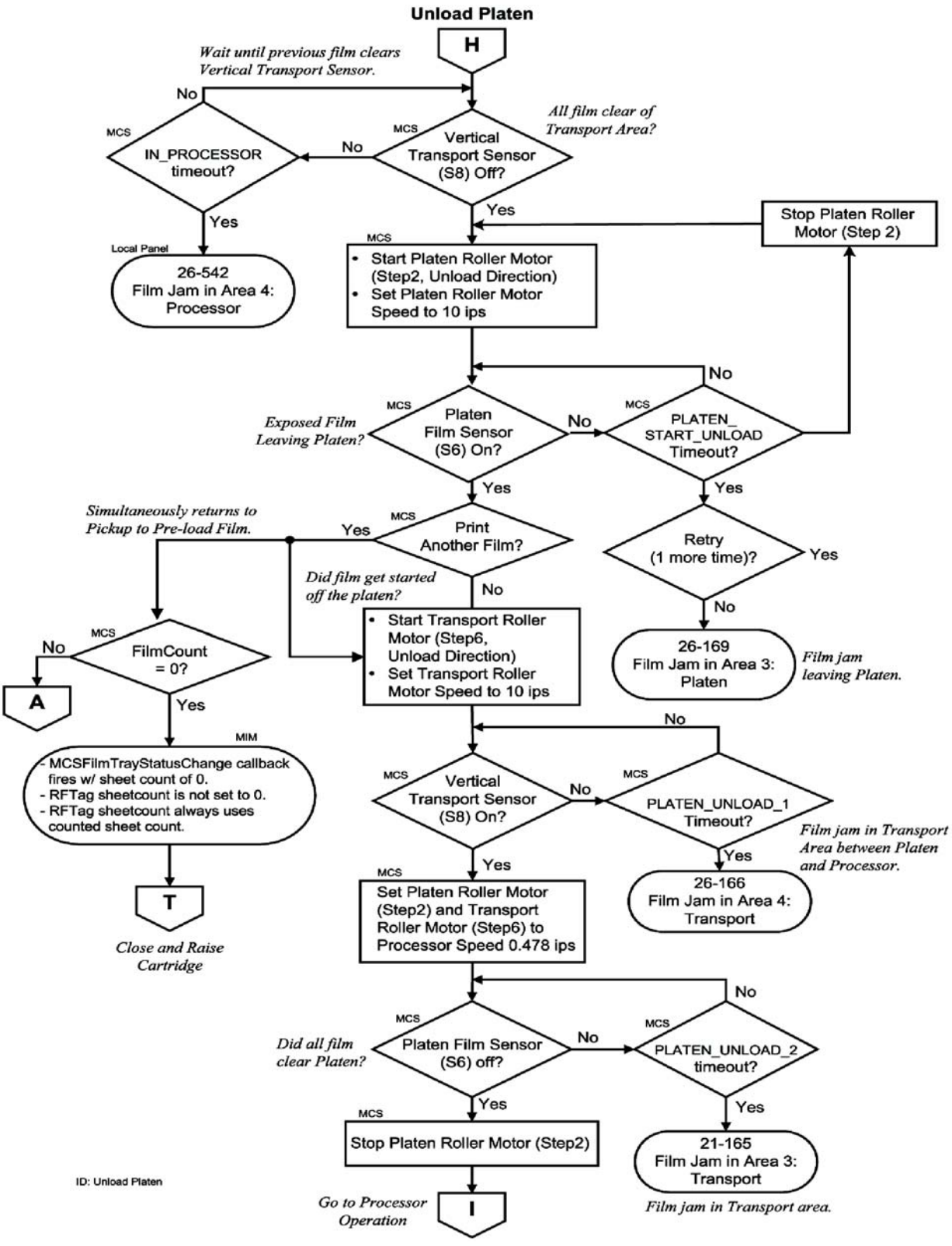


Figure 6-20. Unload Platen Operation

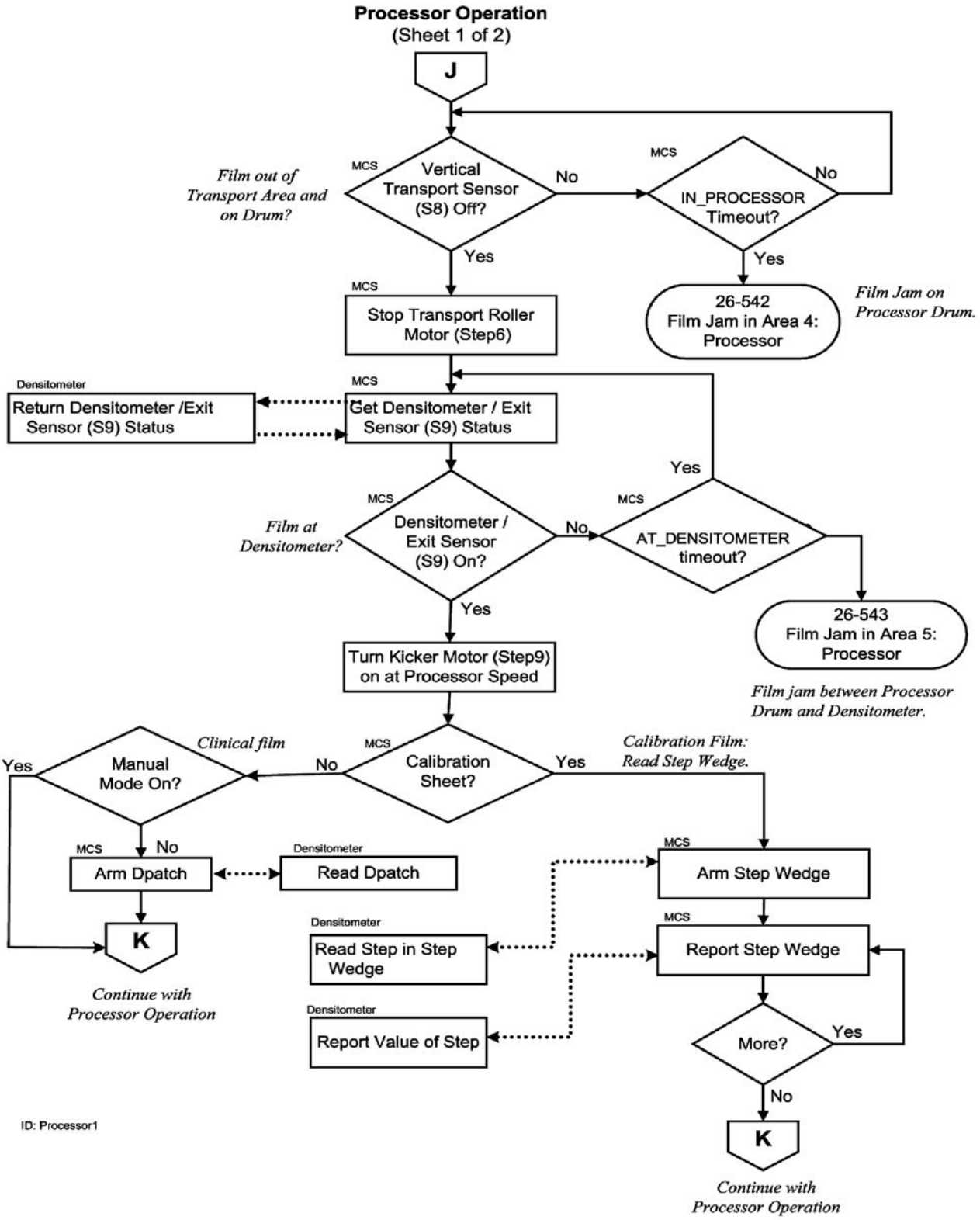


Figure 6-21. Processor Operation (Sheet 1 of 2)

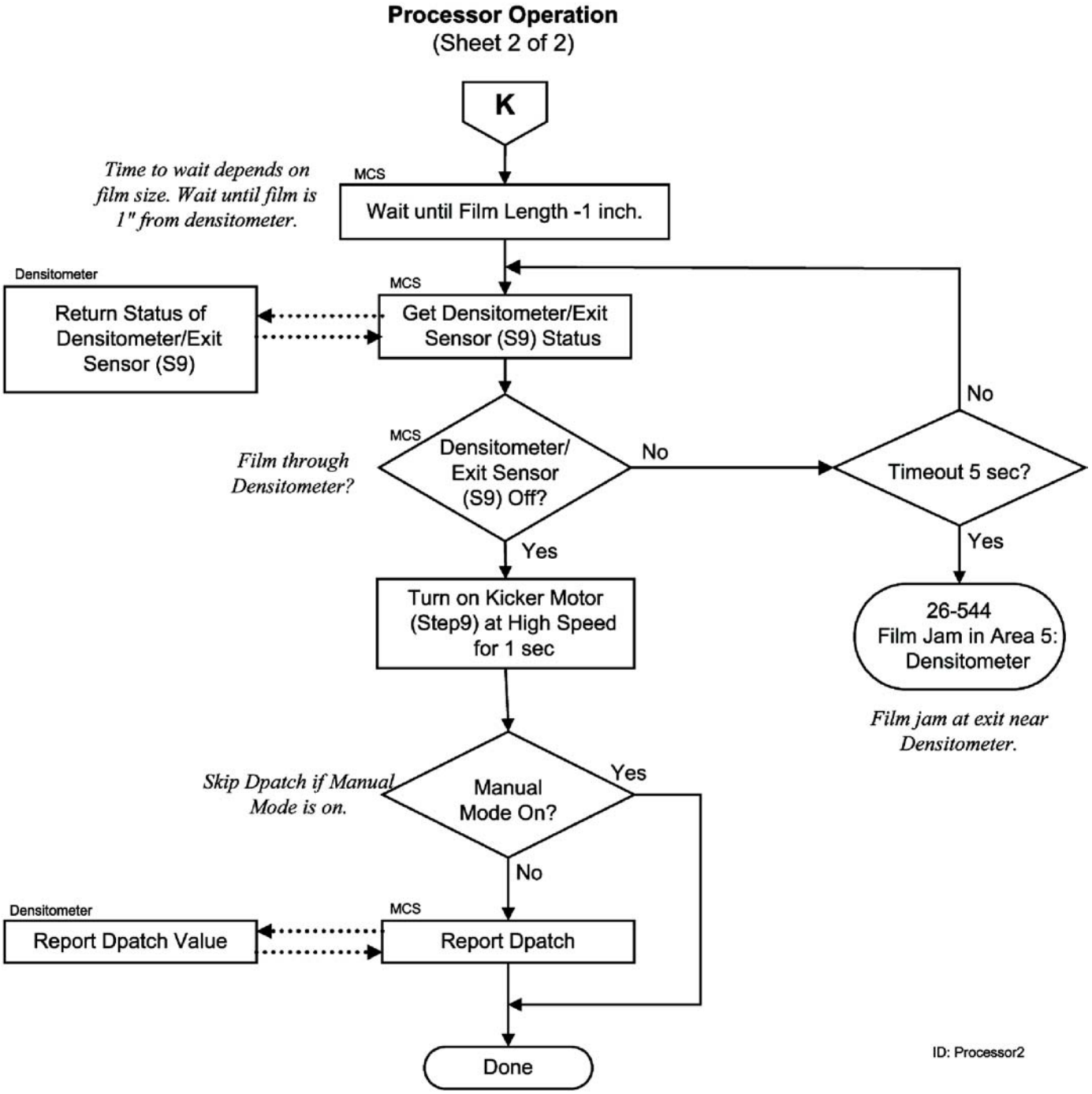


Figure 6-21. Processor Operation (Sheet 2 of 2)

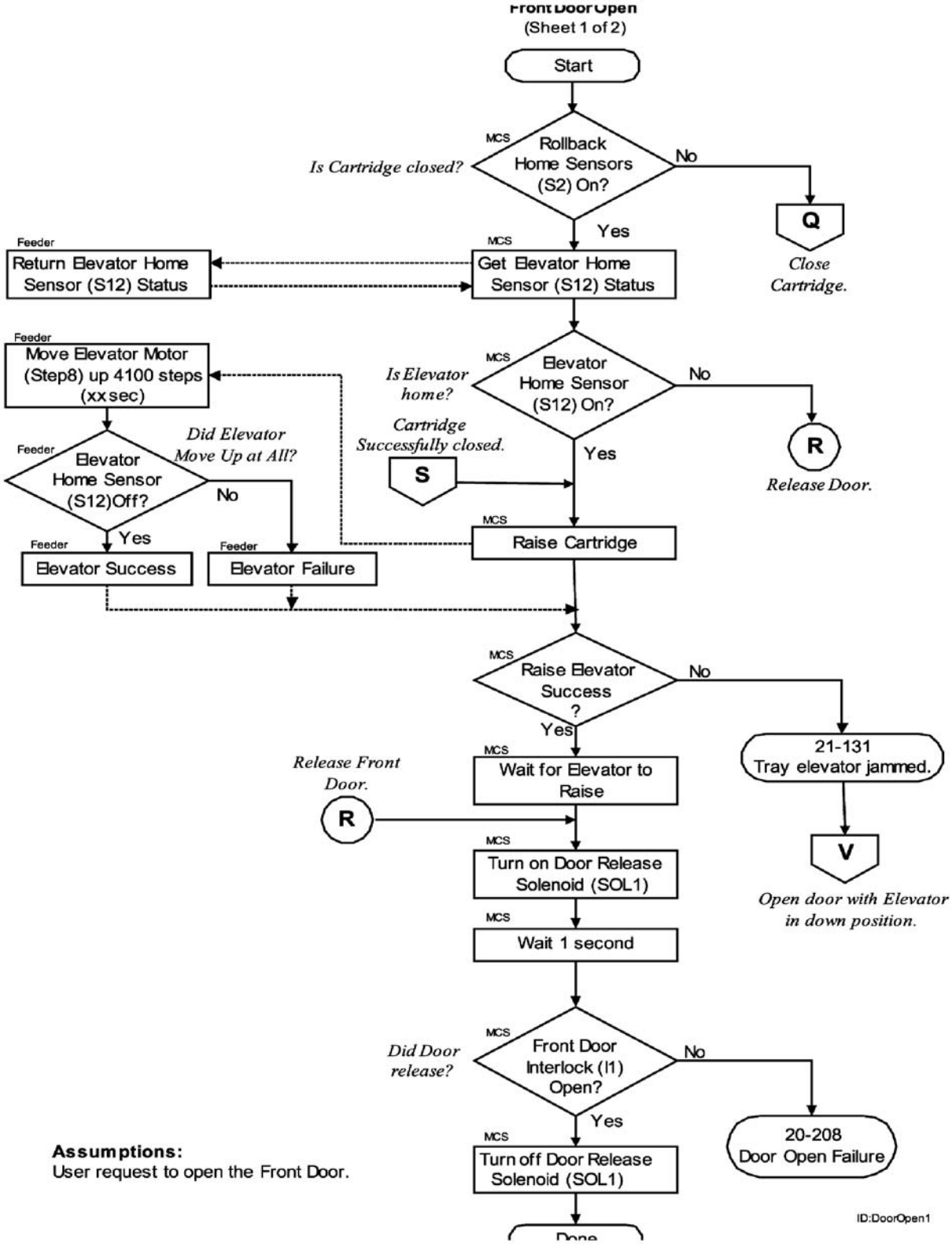


Figure 6-22. Front Door Open Operation (Sheet 1 of 2)

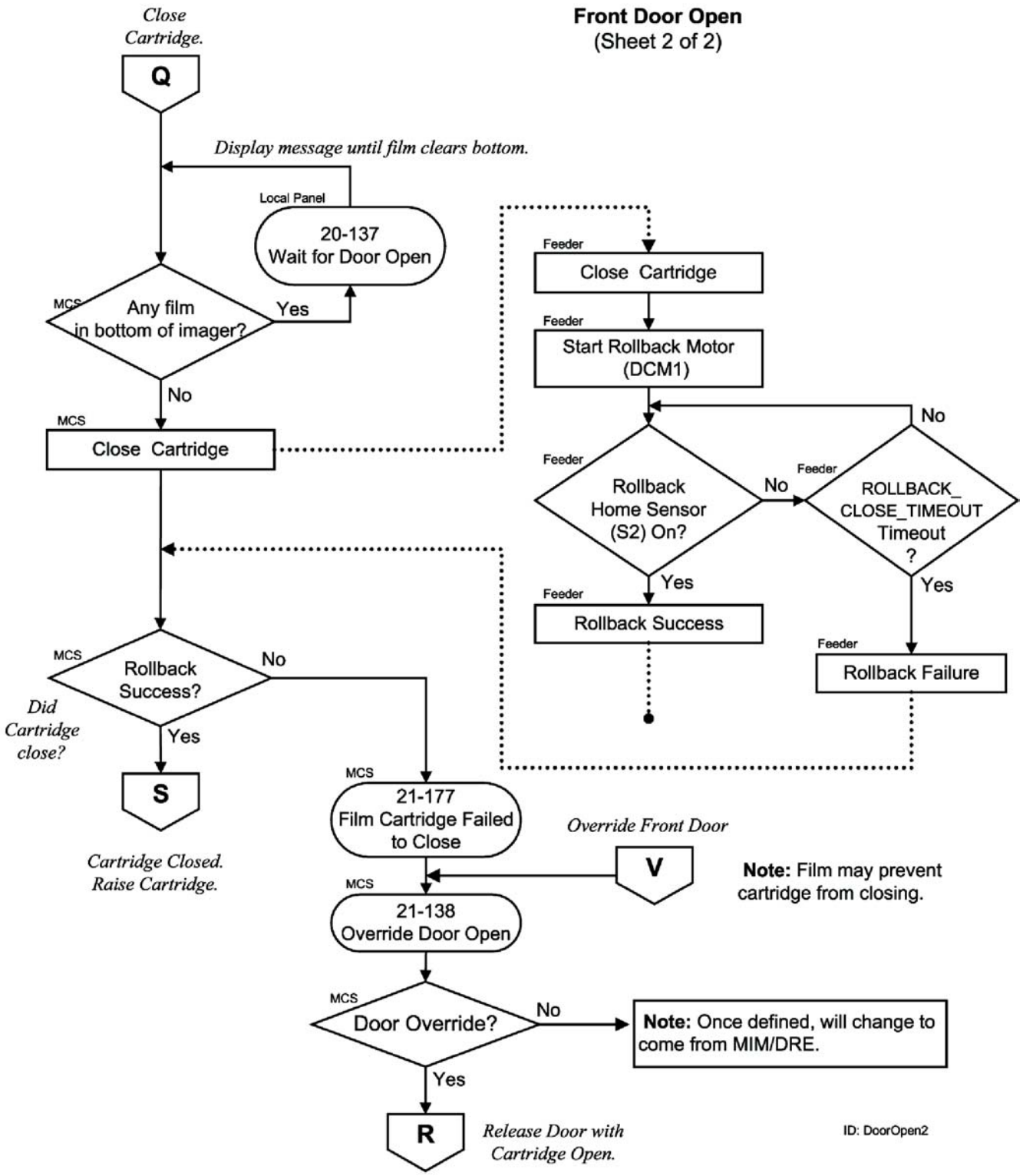


Figure 6-22. Front Door Open Operation (Sheet 2 of 2)

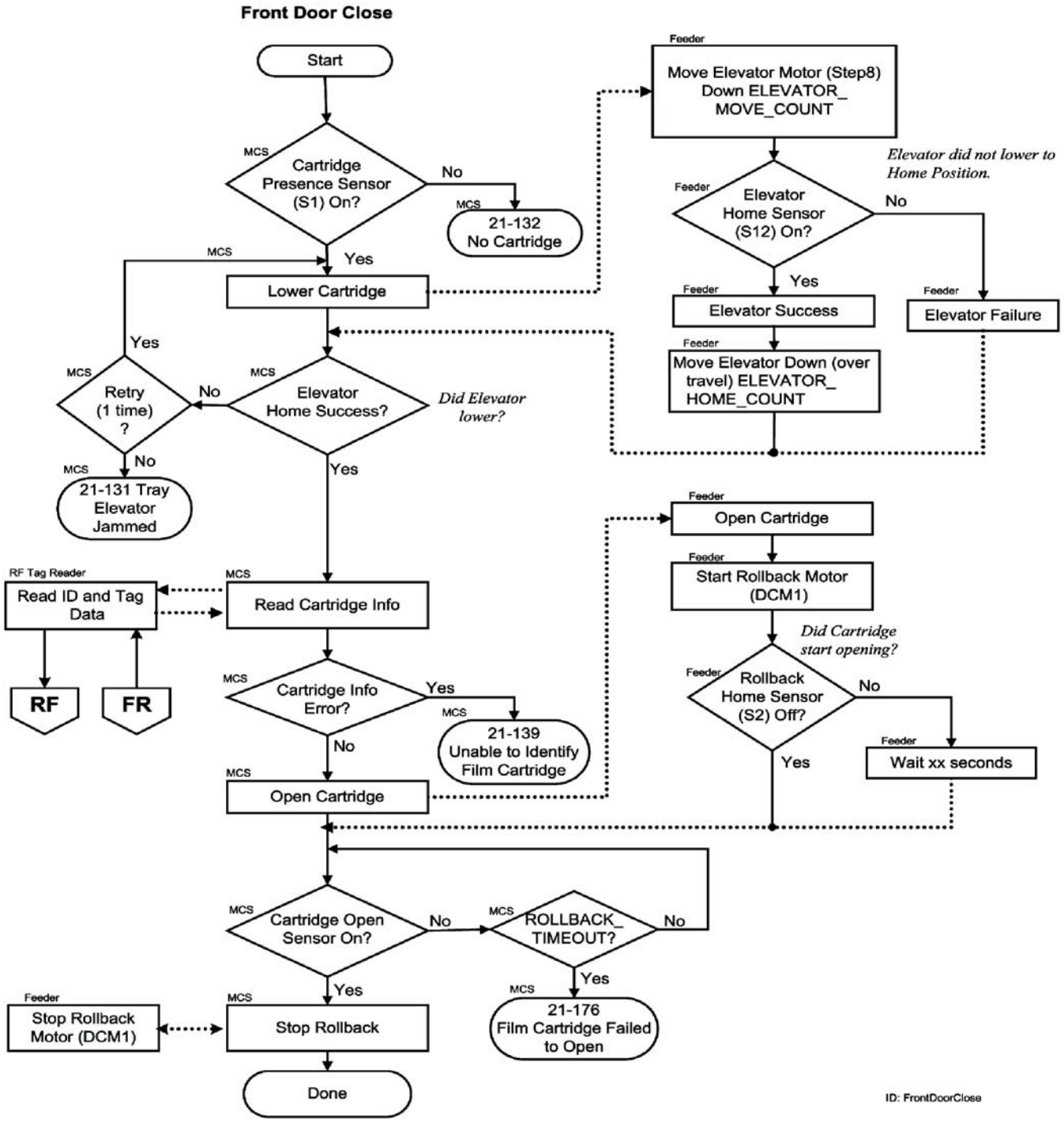


Figure 6-23. Front Door Close Operation

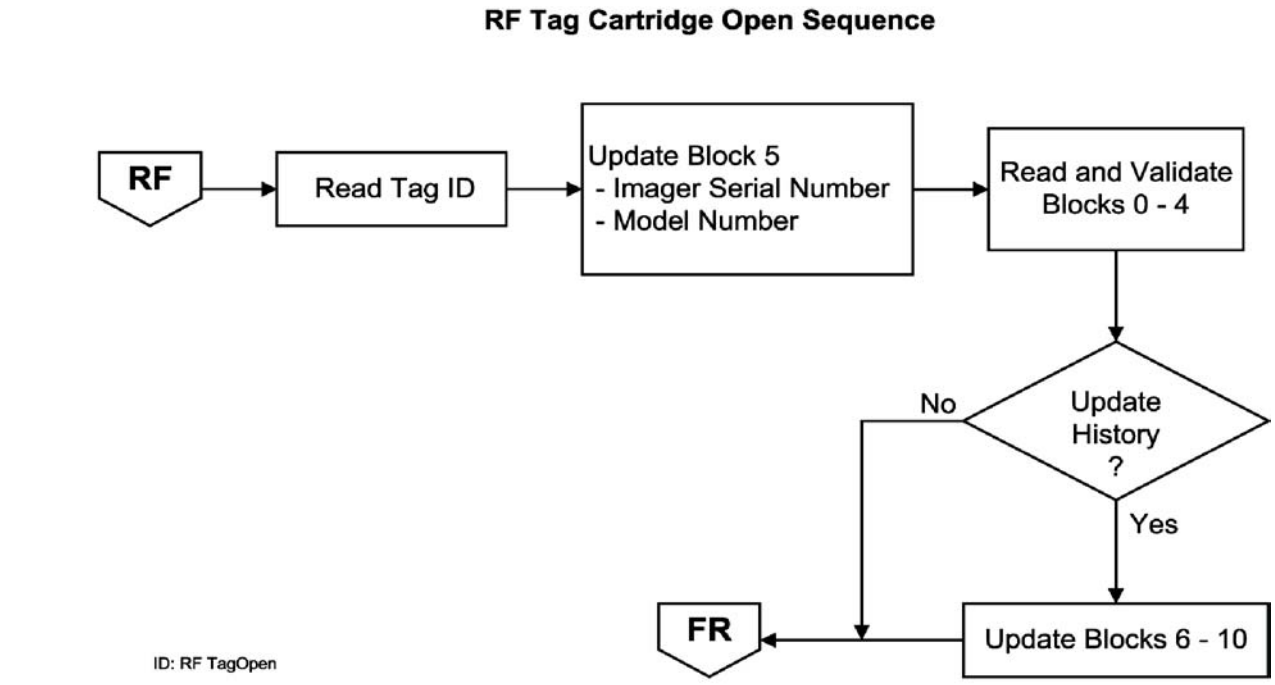


Figure 6-24. RF Tag Open Cartridge Sequence

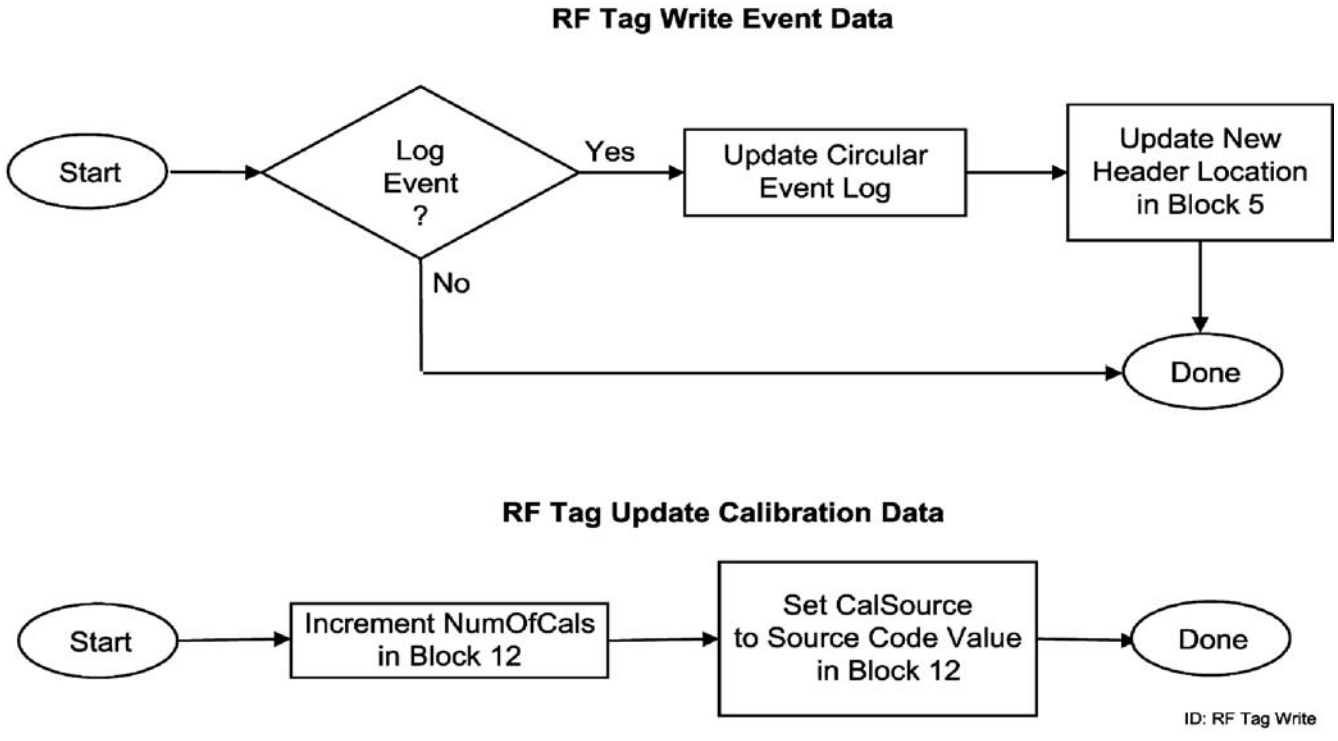


Figure 6-25. RF Tag Write and Update Calibration Data

6-4-10. Special Service Mode Operations

When the IMAGER is operating in service mode (SERVICE SWITCH actuated), the MCS always sees the FRONT DOOR as being closed. Be familiar with the following operations for controlling film CARTRIDGE functions when in service mode:

- To close the film CARTRIDGE and open the FRONT DOOR: Use the LOCAL PANEL **Open Door** key. The CARTRIDGE will close, the ELEVATOR will rise and the FRONT DOOR will open, as normal. But the LOCAL PANEL will indicate “20-208 Door Open Fail”. (The FRONT DOOR still appears closed in service mode.)
- To lower the ELEVATOR and open the film CARTRIDGE: Set the SERVICE SWITCH to normal mode. The MCS will see the FRONT DOOR as being open. Set the SERVICE SWITCH back at service mode. The MCS will see the FRONT DOOR as closed, and will lower the ELEVATOR and open the CARTRIDGE. The IMAGER will now be prepared to transport film.

6-5. AIQC and GSM

The AIQC (Automatic Image Quality Control) system and GSM (Gray Scale Manager) software work together to provide image quality control.

6-5-1. Purpose of AIQC

AIQC includes the entire subsystem of OPTICS, DENSITOMETER, PROCESSOR, RF TAG READER, and LUTs (Lookup Tables) that ensures consistent density from image to image. To provide consistency in density on printed film, AIQC must take into account:

- Film characteristics
- Variations in OPTICS MODULES
- Feedback from the DENSITOMETER, which monitors density

To achieve its goal, AIQC generates Film Models. The functions of these is to map image digital vales to the required film densities. AIQC determines when film calibration must occur, and then processes the density step wedges on the calibration film to create the Film Models.

6-5-2. Purpose of GSM

GSM is the software that receives information from the DENSITOMETER, OPTICS, and RF TAG READER, creates the LUTs, and defines the ATTENUATOR setting for the OPTICS. Software components of GSM are shown in Figure 6-26.

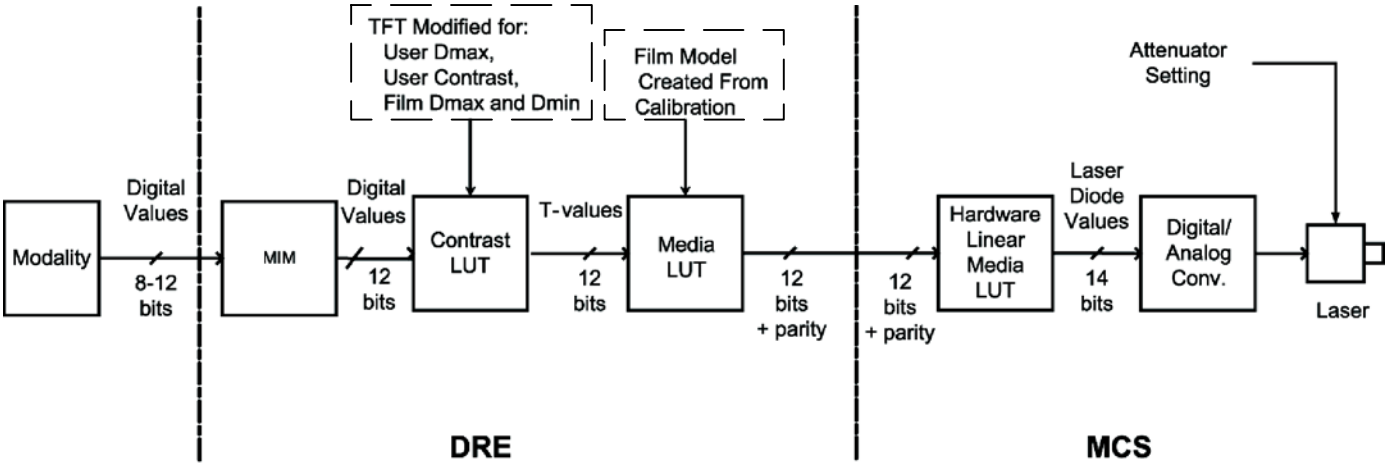


Figure 6-26. Image Path through GSM

The main components of GSM include:

- Contrast LUT – The image received from the MODALITY into PACSLink MIM is filtered through a Contrast LUT, which is created from information from a specific Transfer Function table (TFT), which is modified by user-defined values for Contrast and Dmax, and the film Dmax and Dmin for each image on the film that has a unique contrast setting.
- TFT – This table, selected at installation for the MODALITY, defines the relationship between the digital values input form the MODALITY and the desired Transmittance (T) values output to the Laser. Each TFT is a specific table selected from a TFT set of 15 tables.
- Media LUT – This LUT is created from the Film Model. It contains the output laser diode values necessary for the desired sensitometries.
- Film Model – The Film Model defines the print characteristics for a particular lot of film. It is created from:
  - The Dmin and Dmax constants defined for the film type
  - The density step wedge data read from a calibration print
  - The dynamic range of the Laser

Note

The 3 most recent Film Models are stored in the DRE. When a film CARTRIDGE is opened, the sensitometry information from the RF TAG is compared to the data in the Film Models. If the TAG data matches an existing Film Model and the date of creation of the Film Model is 7 days old or less, the Media LUT is built from this Film Model. Otherwise a calibration print is requested and a new Film Model is built.

- Hardware Media Linear LUT – This LUT exists in firmware on the MCS Board. In earlier IMAGERS this LUT performed the same functions as the Media LUT in the DRE software. In the 8150 IMAGER the sole purpose of the Media Linear LUT is to convert 12–bit image data to 14–bit data for the D-A CONVERTER that feeds the Laser control circuits.

6-5-3. Power up, Calibration, and Print Sequence

Figure 6-27 illustrates the sequence of power-up initialization, diagnostics, calibration, and printing that involves the AIQC components and GSM.

1. Initialize--At power up a series of self-tests is run on the OPTICS, DENSITOMETER, and RF TAG.
2. Perform optics calibration and diagnostics.
3. Read the RF TAG--When a CARTRIDGE is loaded and opened, the RF TAG on the bottom of the CARTRIDGE is read. The TAG data includes emulsion, jumbo, band, film type (blue or clear), version number and CARTRIDGE ID. The slave micro on the RF TAG BOARD passes the emulsion, jumbo, band, and type information to the GSM. (This information is called the “sensi” data.)
4. Load the Film Model--After receiving the sensi data read from the RF TAG, GSM searches for the appropriate Film Model. If it finds the Film Model, the Media LUT is created (go to step 7). If a Film Model has not yet been created for this sensi data, or if the Film Model is older than 1 week (no calibration for over a week), a calibration print is scheduled (step 5).
5. Create and Read a Calibration Print--The calibration print creates the Film Model and the resulting Media LUT. A calibration print is requested in any of the following circumstances:
   - A CARTRIDGE is loaded with an emulsion number, jumbo, band, and type that are not defined in the Film Model.
   - A calibration request is issued from the LOCAL PANEL.
   - The target Dpatch does not equal the Dpatch moving average (see step 9 below).
   - More than 1 week has elapsed since the last calibration print for the current CURRENT.
6. Create a New Film Model--The Film Model is built from the sensi data read from the RF TAG, the time stamp (date of the last calibration), Dmin and Dmax values established in calibration, calculated film speed, and Dpatch data.
7. Create a Media LUT and Set the ATTENUATOR--The data from the Film Model is used to create an LUT that interpolates required laser diode intensity values into the pixel array passing through the LUT. Then the Laser Attenuator is set to obtain the required densities on film.
8. Print the Film--The film is printed using the Media LUT and ATTENUATOR setting established by the Film Model from calibration data.
9. Read the Dpatch when Film is Printed (if Dpatch is used)-- For each image printed, the density of the Dpatch on the trailing edge of the film is measured. The density read is used to adjust the OPTICS ATTENUATOR as follows:
   - If Target Dpatch = Dpatch Moving Average, no ATTENUATOR correction is required.
   - If Target Dpatch – Dpatch Moving Average < or = 0.7, the ATTENUATOR must be adjusted.
   - If Target Dpatch – Dpatch Moving Average > 1.3, a calibration print must be scheduled.
10. Build a new Film Model and Adjust the ATTENUATOR, if necessary--The ATTENUATOR setting is adjusted to obtain corrected density readings on ensuing Dpatches.

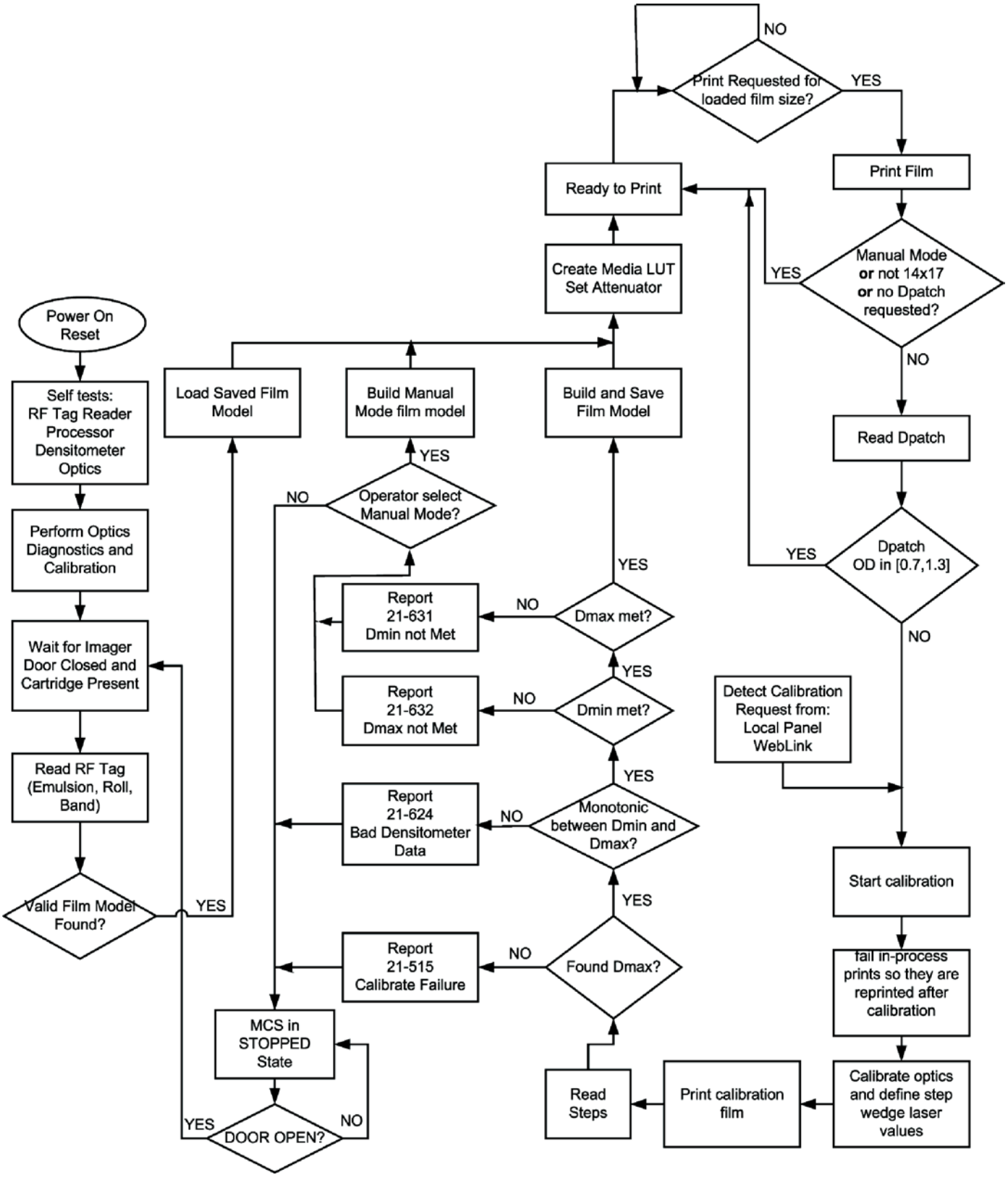


Figure 6-27. Sequence of AIQC and GSM Functions

Section 7 – Troubleshooting

7-1. General Troubleshooting Table

Table 7-1 contains a list of IMAGER problems, along with causes and recommended remedies.

Table 7-1. General Problem Analysis

Problem	Cause	Remedy
Error code on LOCAL PANEL.	MACHINE problem	See Section 8.
IMAGER hangs up during a functional sequence. Error code indicates a suspect SENSOR or MOTOR.	Failed SENSOR Failed MOTOR	See paragraph 7-2-8. See paragraph 7-2-6.
SYSTEM will not communicate, DRE to MCS (Error 10–910).	Possibilities are: – Network (10.x.xx) – Software compatibility problem – Corrupt DRE software – Bad HARD DRIVE – Bad PCIO BOARD – Bad CABLE or connection – MCS BOARD problem	See 10–910 QuickSheet in Section 8.
Scratches on film.	Dirt or foreign matter in film path.	See paragraph 7-6.
Image stretched or shortened.	OPTICS translation speed off or SOP delay incorrect.	Adjust. See paragraph 3-4.
Clear margin on side of film.	OPTICS translation speed off or SOP delay incorrect.	Adjust. See paragraph 3-4.
Left and right margins of film are not equal (at about 4 mm).	OPTICS translation speed off or SOP delay incorrect. If position varies, it may be caused by translation interference (dirty PLATEN or HARNESS catching).	Adjust. See paragraph 3-4. Clean SCANNER RAILS with CLEANING PAD and ISOPROPYL ALCOHOL. Also, clean CABLE and FLYWHEEL. Check for interference with HARNESS.
Banding on film.	May be caused by PROCESSOR ROLLERS.	Replace ROLLERS as necessary.
White streaks on film.	Parity error or data underrun. If there are a number of streaks, could be a bad CABLE connection.	See QuickSheet for Error Code 20-912.
Sharply defined clear specks on film, usually in lower left area of film.	Debris from rubber PLATEN ROLLERS is deposited on film during film centering. Clear specks appear on film in areas where debris contacts film during exposure.	Clean the PLATEN (paragraph 5-4-5).

Problem	Cause	Remedy
Intermittent vertical bands with the lines alternating light and dark. The lines are about 0.5 mm wide. These “vibration” bands occur more often in mobile vans, but can also occur at fixed sites.	An external motion affects the IMAGER during exposure. This can be from a DOOR closing, MOBILE LIFT operating, vibration of an AIR CONDITIONER, a person touching the IMAGER, or even a person walking in the area.	**Do not** replace the SCANNER MODULE. Instruct the user not to touch the IMAGER during a print cycle.
Vertical bands similar to vibration bands, except the bands are narrower, usually less than 0.5 mm wide.	Power line noise or electrical noise in the CONNECTOR or CABLE entering the SCANNER MODULE.	**Do not** replace the SCANNER MODULE. Try the following in the order listed: 1. Disconnect, then reconnect flat RIBBON CABLE in PLATEN. Connection must be tight. 2. Disconnect, then reconnect CABLE from MCS to PLATEN. Connection must be tight. 3. Replace flat RIBBON CABLE. 4. Install a POWER LINE CONDITIONER.
Clear broad vertical lines repeated in the same area, but intermittent.	The RIBBON CABLE in the PLATEN is bad when flexed at some positions. If kinked, the CABLE will fail within 100 prints. Use caution when handling the RIBBON CABLE.	Replace the RIBBON CABLE.
Vertical line down the film, usually not completely down the full length of the film.	The OPTICS MODULE hesitates during translation across the film because of interference caused by: 1. OPTICS MODULE hits SENSOR WIRES on side of PLATEN. 2. Flat RIBBON CABLE. 3. Debris on TRANSLATION RAILS or FLYWHEEL.	Remove sources of interference. Clean RAILS and FLYWHEEL with ISOPROPYL ALCOHOL. Check that RIBBON CABLE travels smoothly and does not touch OPTICS MODULE or ATTACHMENT PLATE as it moves.
Vertical bands repeated across the film at about 1/4 inch intervals.	The CAPSTAN ROLLER in the PLATEN ASSEMBLY is out of round, worn, or has flattened after a period of non–use. This can occur if the SYSTEM is run with the LOCK SCREWS for the SCANNER ASSEMBLY in place, if the IMAGER was shipped without the CAPSTAN MOTOR being tied away from the FLYWHEEL, or if the CAPSTAN is defective.	Replace the STEPPER MOTOR MOUNTING ASSEMBLY (96–0000–5438–3)
Broad light band across the film (horizontal banding)	Dust on FLEX LENS L3 in the OPTICS MODULE.	Remove the dust. See paragraph 5–5.
Intermittent black film, or black film with white streaks	Alignment problems in FRONT DOOR INTERLOCK.	Re-align.

Problem	Cause	Remedy
Repeated film jams	Mechanical or electronic failure in a FILM TRANSPORT MODULE: ROLLBACK, FILM PICKUP, FEED ROLLER, PLATEN, VERTICAL TRANSPORT, or in the FILM PROCESSOR MODULE.	See paragraph 7-5.
Blank Films	OPTICS RUBBER SLIT COVER not removed at installation.	Remove COVER from optics slit.
Fuzzy prints at end of film	Tape blocking optics slit.	Remove SCANNER UNIT and remove tape.
Horizontal band near top or bottom of film	Double back tape used to hold rubber slit cover stuck to optics FRU.	Remove tape.

Problem	Cause	Remedy
Jam Loading Exposure Platen (Error 26–163). Film may not feed on top of the Feeder Roller or loud noise when Film Pickup is loading film into the Feeder Assembly.	The Cup Plate Assembly does not rotate freely due to the metal plate that holds the cups being too long.	Manufacturing is addressing this problem. In the field, try the following: 1. Remove the Film Pickup Assembly from the machine. 2. Move the motor away from the gear rack and extend the pickup assembly. 3. Check that the Cup Plate rotates freely. It will pivot on the shoulder screws. The small roller should move up and down in the slot as you pivot the assembly. NOTE: If it does rotate freely, stop here. This is not a problem on your machine. Refer to the Service Manual for additional troubleshooting. 4. If it does not rotate freely, loosen the shoulder screws on each side of the Heal Pad (do not remove the screws) and check to see if it rotates freely now. 5. With the shoulder screws loose, if it rotates freely, bend the Heal Pad tabs (this is what the shoulder screws screw into) slightly outward on the Heal Pad Assembly. This can be done by using a flat blade screwdriver between the tab and the Heal Pad. They should be just a little past 90 degrees. 6. Tighten the shoulder screws. When tightened properly, the shoulder screw should be next to the Cup Plate and the washer on the inside should be next to the Heal Pad tab. 7. Check that the Cup Plate Assembly still rotates freely. If it does rotate freely, stop here, this is not a problem on your machine. Refer to the Service Manual for additional troubleshooting.

Problem	Cause	Remedy
Jam at Transport (Error 26–165). Film feeds part way into the platen and errors when trying to exit the Platen assembly.	The Platen Sensor (S6) changes state as the film enters the platen. Because the film is still partially in the entrance chute, a jam occurs when trying to exit.	Check and reform or replace Platen sensor (S6). Check that the Platen roller bearings are pushed all the way into the platen and the securing screws are tight.
Processor Drum Temperature (Error 28–551 & 28–554). Drum temperature does not reach the proper temperature in time or exceeds the temperature.	The screws that hold the gear driven end of the drum have loosened. The Voltage to Frequency Converter adjustment (100KHz) on the MCS board is out of adjustment.	Check for loose screws and tighten as necessary. Check Voltage to Frequency Converter adjustment (3–2 Processor Drum RTD)

7-2. Using the Service Tool (Service WebLink)

The SERVICE TOOL (“Service WebLink”) provides the following functions:

- Configuration – Includes tools for configuring the IMAGER.
- Diagnostics – Includes tools for testing components of the IMAGER.
- Logs – Provides access to logs of events that occur in the IMAGER.
- Statistics – Displays total numbers of images printed on all film sizes.
- System Information – Provides information about the IMAGER, the service user, and software versions.
- Upgrade – Provides ability to upgrade the DRE software, and the MICROCONTROLLER applications of the MCS.
- Utilities – Includes such functions as Logoff, Restart, Shutdown., Backup and Restore, and image file transfer.

Control Panel – Displays status of DRE, MCS. and SERVICE TOOL.

7-2-1. Setting Active Controls

Before you use the Service Tool you must make the following configuration settings in Internet Explorer on your LAPTOP COMPUTER

1. On your COMPUTER, open **Intenet Explorer**.
2. Select **Tools**> **Internet Options** from the Main Menu bar.
3. Select the **Security** tab.
4. Select the **Local Internet** icon and then press the **Custom Level** button.
5. Under **Active X Controls and Plug-Ins**:
   a. Set **Download signed Active X controls** to “Enable“.
   b. Set **Download unsigned Active X controls** to “Prompt”
   c. Set **Initialize and script Active X controls not marked as safe** to “Prompt”
   d. Set **Run Active X controls and plug-ins** to “Enable”
   e. Set **Script Active X controls marked safe for scripting** to “Enable”
6. Under **Cookies**:

   (**Note:** On Internet Explorer 6 select the **Privacy** tab; there is no **Cookies** section.
   a. Set **Allow cookies that are stored on your computer** to “Enable”.
   b. **Set Allow per-session cookies (not stored**) to “Enable”.
7. Under **Miscellaneous**, set **User data persistence** to “Enable”.

7-2-2. Network Settings for Service WebLink

If your computer is unable to connect to the IMAGER, try the following net work settings;

1. From your Desktop, right–click on **Network Neighborhood** and select **Properties**.
2. From the Adapters tab, select your NETWORK ADAPTER.
3. With the NETWORK ADAPTER selected, click **Properties** and select the **Advanced** tab.
   a. In the Property window, select **Line Mode**.
   b. In the Value drop–down list, select **Half–Duplex**.
   c. In the Property window, select **Line Spec**.
   d. In the Value drop–down list, select **10 MBS** and click **OK**.
   e. Click **OK** again.
4. From the **Start** menu, select **Shut Down** and then **Restart**.
5. Connect your computer to the IMAGER SERVICE PORT with a straight–through PATCH CABLE.
6. Shut down and then restart the IMAGER.

7-2-3. Accessing the SERVICE TOOL

1. Use a straight–through *Ethernet* PATCH CABLE to connect your LAPTOP COMPUTER to the SERVICE PORT on the IMAGER.
2. Change the IP Address on your LAPTOP COMPUTER to **192.168.0.2**. (The IP Address of the IMAGER SERVICE PORT is 192.168.0.1.)

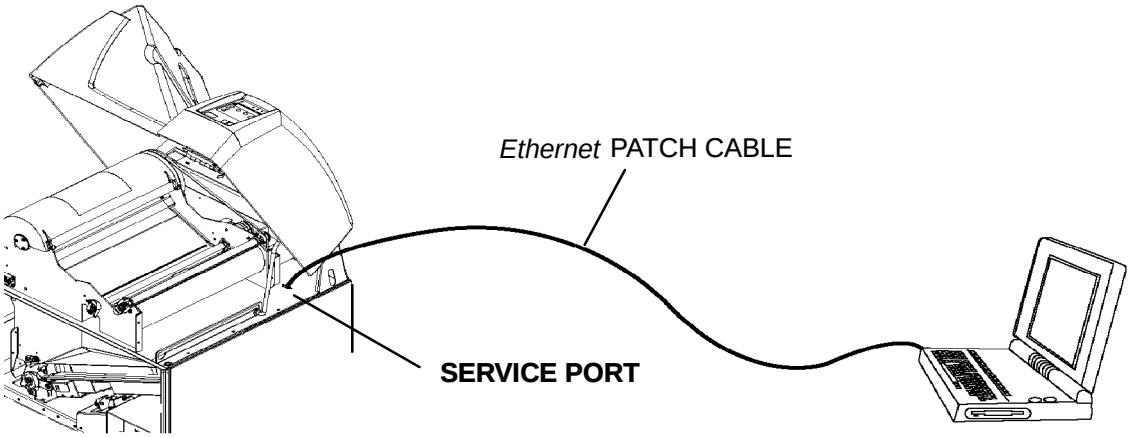
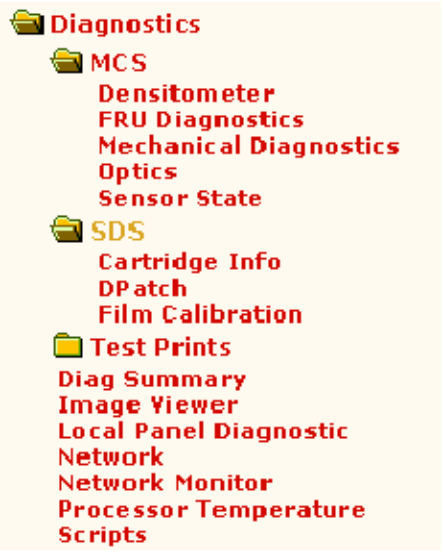


Figure 7-1. Connecting the LAPTOP COMPUTER to the IMAGER

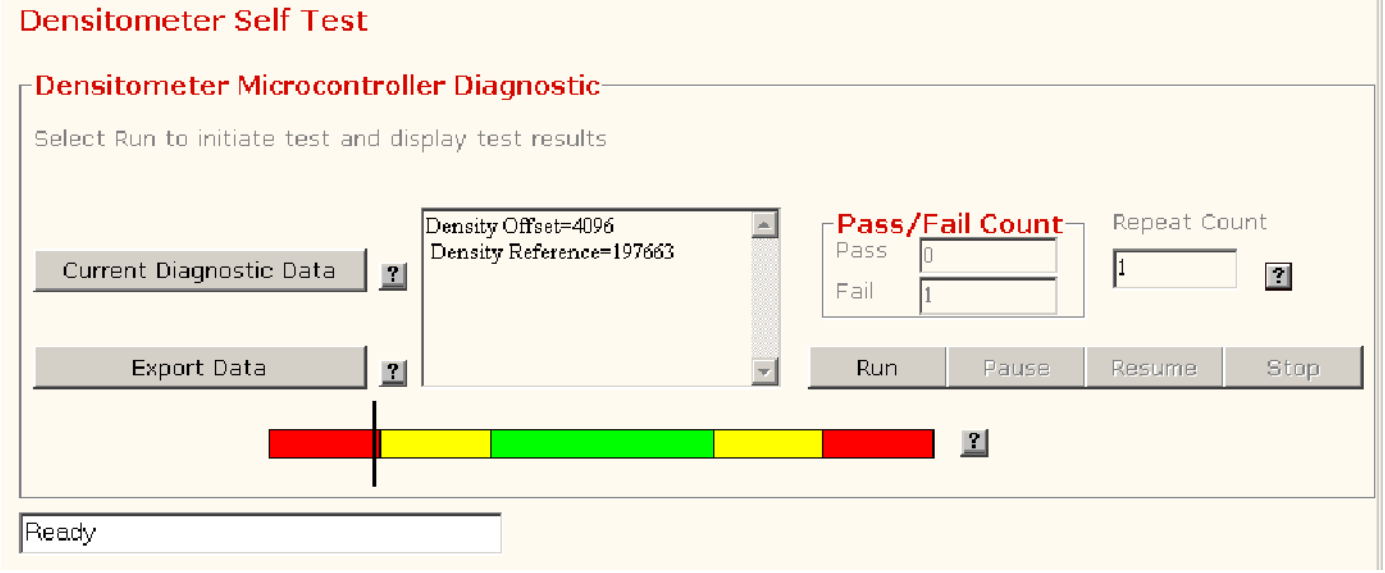
3. Energize the LAPTOP COMPUTER.
4. Use “SecureLink” to connect to the IMAGER (**Start>Programs>Kodak>SecureLink**).
5. Launch “Service WebLink” (**Start>Programs>Kodak>Service WebLink**) to display the main menu of the SERVICE TOOL.
6. Expand the “Diagnostic” menu items to display the diagnostic options.



7-2-4. Testing the DENSITOMETER

This is the same test as the test of the DENSITOMETER run automatically at power on. The test ends with a Pass or Fail indication and displays diagnostic data.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MCS>Densitometer**.
2. If you wish to display the results of the last DENSITOMETER, click [Current Diagnostic Data].



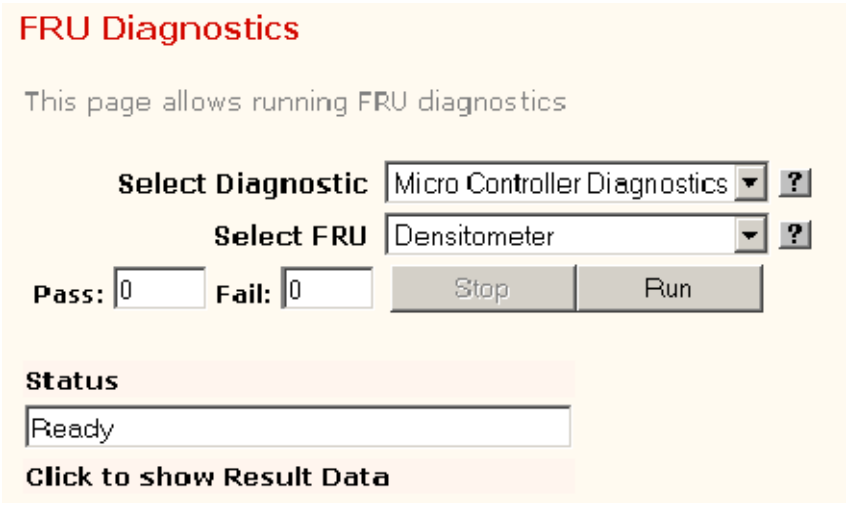
3. To run the DENSITOMETER test, click [Run]. The test sequence:
   - Turns off the Light Source LAMP, then reads A–D counts representing the Density Offset light value 8 times and calculates an average. This value must be 4096 $\pm$ 400.
   - Turns on the Light Source LAMP, then reads the A–D counts for Density Reference 8 times and averages the values. If the average A–D count is not between 750,000 and 850,000, software attempts to adjust the count.
4. To save the test results to a file on your LAPTOP COMPUTER, click [Export Data].

7-2-5. Running the FRU Diagnostics

These diagnostics test the 4 peripheral Micro Controllers on the MCS MicroComm Bus: DENSITOMETER, OPTICS, RF TAG, and TRAY (Feeder). Three operations can be run on each Micro Controller:

- Micro Controller Diagnostics – This is the same test as the diagnostic run at power on.
- Micro Controller Reset – This operation resets the selected Micro Controller.
- Micro Communications – The operation tests whether the MCS CPU can communicate with the selected Micro Controller.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MCS>FRU Diagnostics**.



2. To run a test operation:
   a. Select the type of Diagnostic operation: Micro Controller Diagnostics, Micro Controller Reset, or Micro Communications.
   b. Select the desired Micro Controller: Densitometer, Optics, RF Tag, or Tray.

Note

For the Micro Communications test or the Reset operation, you can also select the MCS Micro Controller.

   c. Click [Run] to start the test operation.
      - Micro Controller Diagnostics will run once and display “Pass” or “Fail”.
      - Micro Communications tests will continue to cycle until you click [Stop]. A “Pass” or “Fail” will be displayed for each test.
      - If you select Micro Controller Reset, you will lose your connection to the LOCAL PANEL and a 10-910 error will display. You will have to shut down and restart the IMAGER.

Note

After running a test, select “Click to show Result Data” to display the test data.

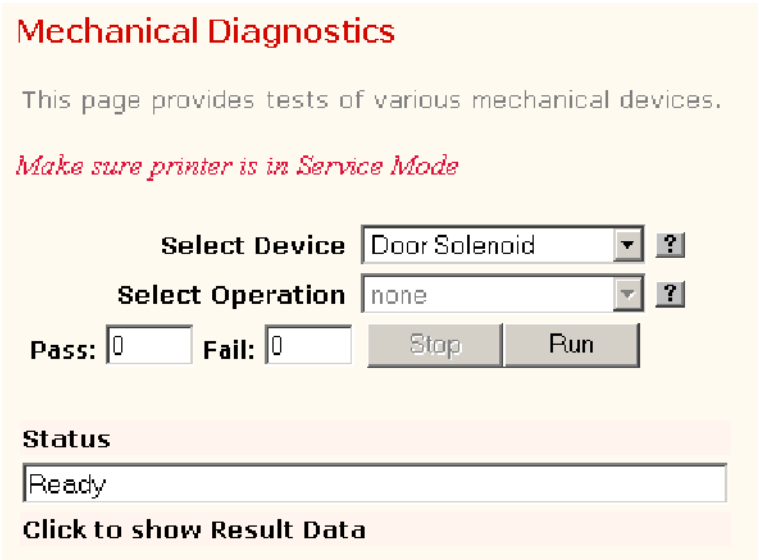
7-2-6. Running the Mechanical Diagnostics

These diagnostics include tests for DOOR SOLENOID SOL1 and all MOTORS in the IMAGER except the VACUUM PUMP and the following MOTORS that run continuously: the PROCESSOR MOTOR and the OPTICS SPINNER MOTOR. The diagnostics simply turn on the device selected for a short period, then turn it off and report “Pass” or “Fail”.

Note

Descriptive data for all MOTORS is provided in Table 7-2, and locations of the MOTORS are shown in Figure 7-2.

1. Set the SERVICE SWITCH in the Service position.
2. From the main menu of the SERVICE TOOL, select **Diagnostics>MCS>Mechanical Diagnostics**.



3. From the **Select Device** dropdown menu, select the device to be tested. These include:
   - Door Solenoid
   - Kicker Motor
   - Vertical Transport Motor
   - Optics Motors
   - Platen Motors
   - Tray Motors
4. From the **Select Operation** dropdown menu, select the type of test or a specific MOTOR if the device selected includes more than one MOTOR. “Devices” which include more than one MOTOR are:
   - Optics Motors – You can select the Optics Attenuator Motor or the Optics Translation Motor for testing. Or you can choose to command the Translation Motor to move the OPTICS to the shipping position.
   - Platen Motors – You can select the Feed (Platen Roller) Motor or the Film Centering Motor.

- Tray Motors – You can choose to exercise any of the following motors: Rollback Motor (to Open or Close the FILM CARTRIDGE), PIckup Motor, Feed Roller Motor, Feed Roller Open Motor (to either Open or Close the FEED ROLLERS), and Elevator Motor (to either move the ELEVATOR Up or Down).

5. To start the test, click [Run]. When the test is completed either “Pass” or “Fail” will display.
6. Click the bottom line of the screen to display test results data.
7. After completing the test, set the SERVICE SWITCH to the User position and restart the IMAGER.

Table 7-2. Functions of MOTORS

Ref Des.	MOTOR	ASSEMBLY	Power	Drive Circuit
DCM1	ROLLBACK	ROLLBACK	Haz. +12 vdc	DC DRIVE CHIP on FEEDER CONTROL BOARD
DCM2	PICKUP	PICKUP	Haz. +12 vdc	DC DRIVE CHIP on FEEDER CONTROL BOARD
DCM3	OPTICS SPINNER	SCANNER	± 12 vdc	DAC and driver on OPTICS Mod. Bd.
DCM4	FEED ROLLER OPEN	FEED ROLLER	Haz. +12 vdc	DC DRIVE CHIP on FEEDER CONTROL BOARD
DCM5	VACUUM PUMP	PICKUP	Haz. +12 vdc	FET on FEEDER BOARD
Step 1	FEED ROLLER	FEED ROLLER	Haz. +24 vdc	STEPPER DRIVE CHIP on FEEDER CONTROL BOARD
Step 2	PLATEN ROLLER	IMAGING	Haz. +24 vdc	STEPPER DRIVE CHIP on MCS BOARD
Step 3	OPTICS ATTENUATOR	SCANNER	+12 vdc	STEPPER DRIVE CHIP on OPTICS MODULE BOARD.
Step 4	OPTICS TRANSLATION	SCANNER	Haz. +12 vdc	MICRO/STEPPER DRIVE CHIP on MCS BOARD
Step 5	PROCESSOR	PROCESSOR	Haz. +12 vdc	MCS BOARD
Step 6	VERTICAL TRANSPORT	TRANSPORT		
Step 7	FILM CENTERING	IMAGING	Haz. +12 vdc	STEPPER DRIVE CHIP on MCS BOARD
Step 8	ELEVATOR	ELEVATOR	Haz. +12 vdc	STEPPER DRIVE CHIP on FEEDER CONTROL BOARD
Step 9	KICKER	PROCESSOR		

Note

Hazard +12 and +24 vdc power is applied through RELAY K1 on the MCS BOARD. When the REAR PANEL is removed or the FRONT DOOR is opened, this RELAY opens, disabling power to all MOTORS that use “hazard” power.

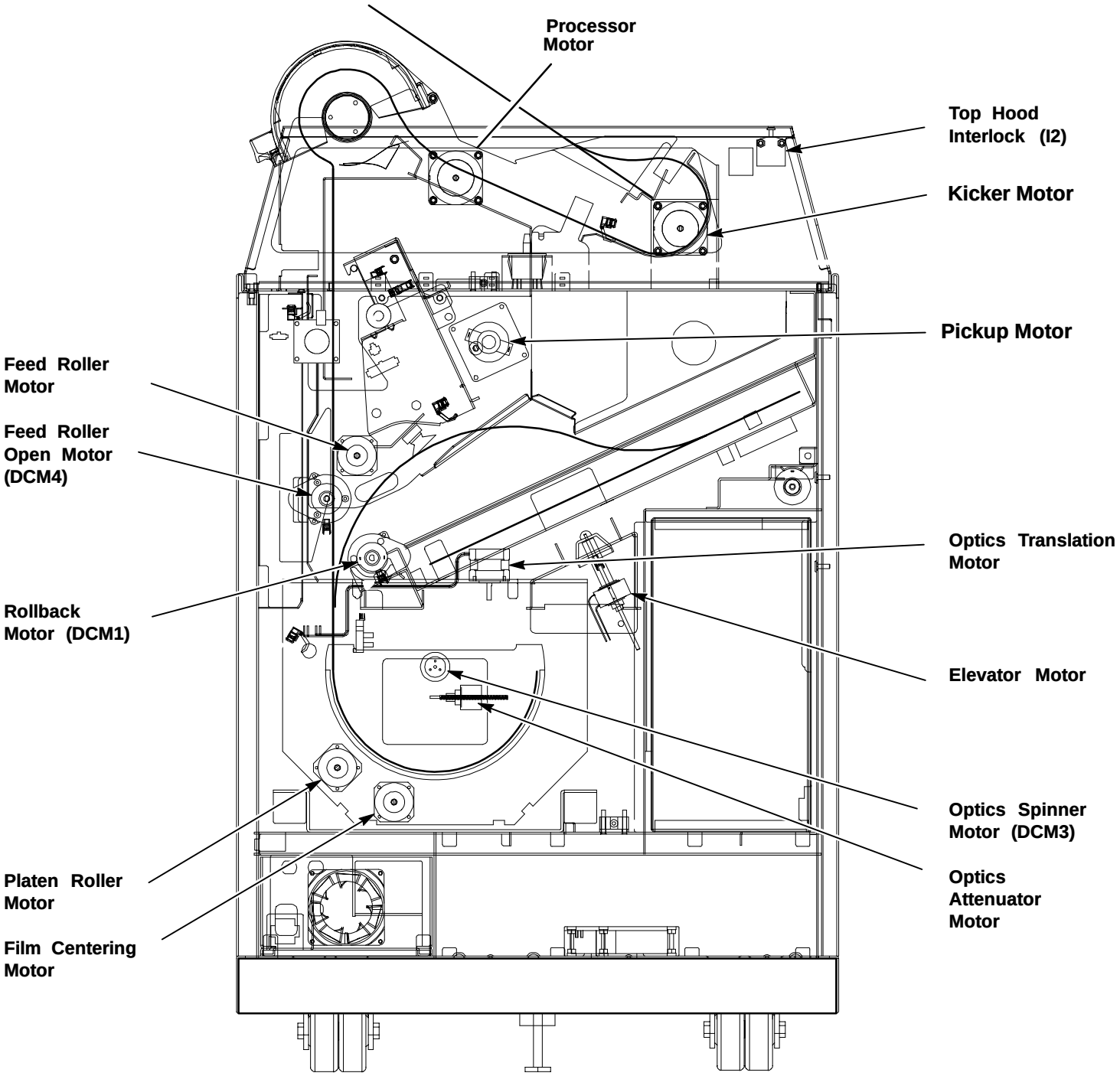
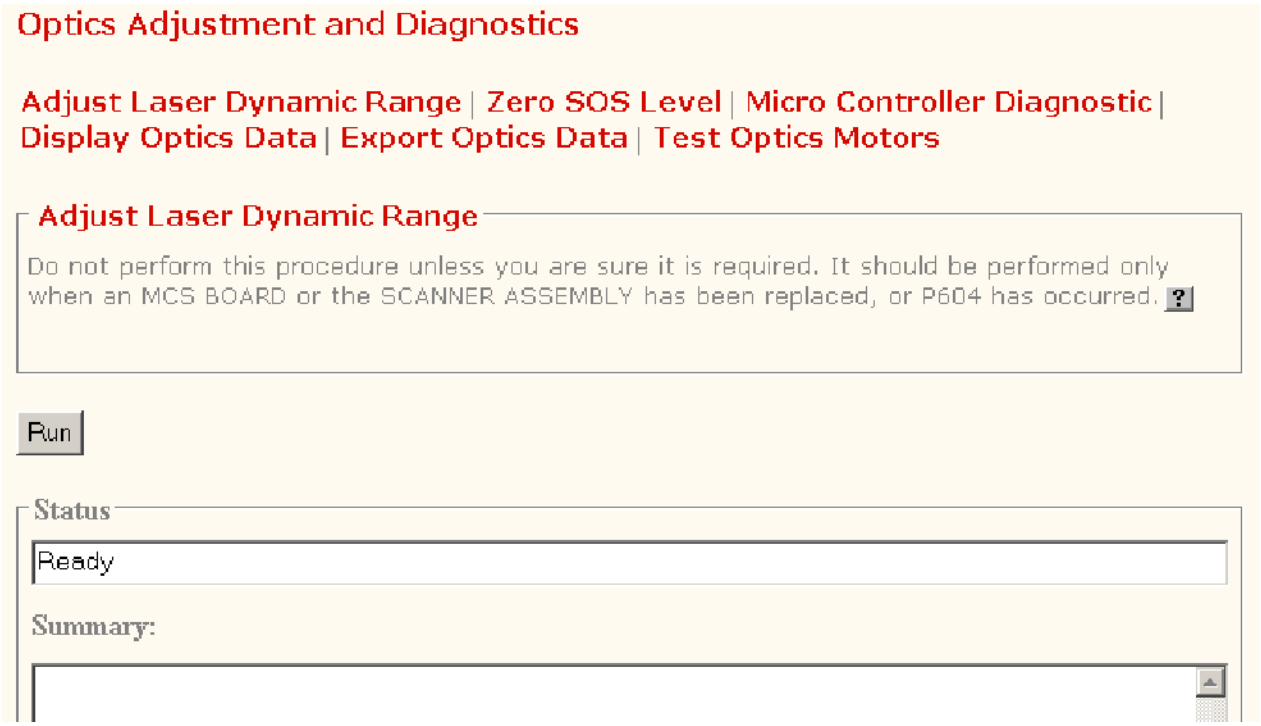


Figure 7-2. Locations of MOTORS

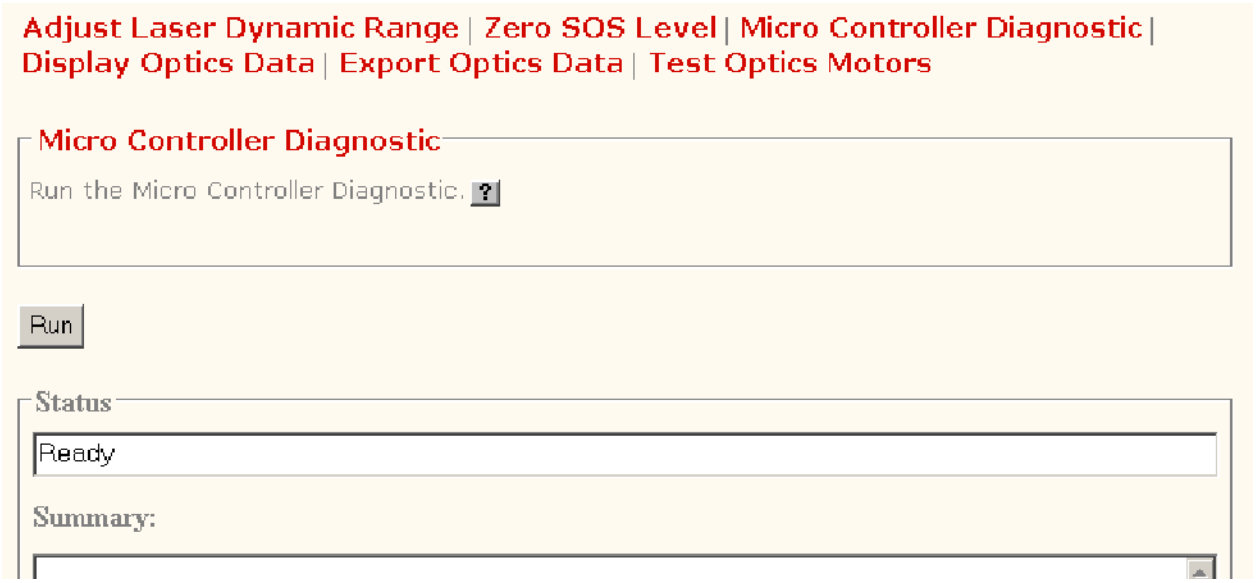
7-2-7. Running Tests of the OPTICS

The procedures on the “Optics Service” menu include both adjustments and diagnostics. To adjust Laser Dynamic Range see paragraph 3-6. To Zero SOS Level, see paragraph 3-7. The other procedures on this menu are described below.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MCS>Optics**.


Optics Adjustment and Diagnostics
Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Adjust Laser Dynamic Range
Do not perform this procedure unless you are sure it is required. It should be performed only when an MCS BOARD or the SCANNER ASSEMBLY has been replaced, or P604 has occurred.
Run
Status
Ready
Summary:

2. To test the OPTICS Micro Controller, select **Micro Controller Diagnostic**.


Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Micro Controller Diagnostic
Run the Micro Controller Diagnostic.
Run
Status
Ready
Summary:

   a. Click [Run] to run the diagnostic for the Optics Micro Controller.

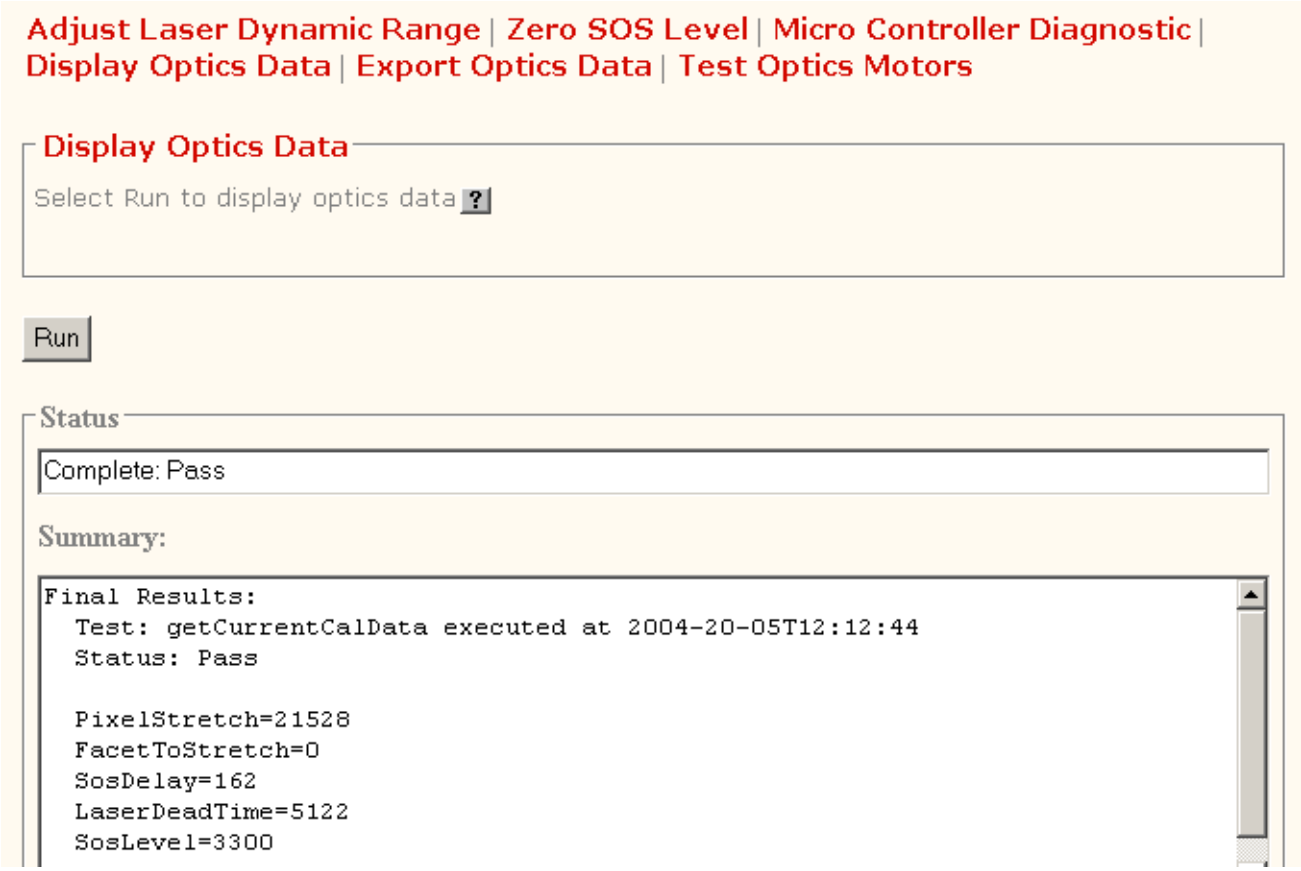
Note

This is the same diagnostic as that run during the power on self-test of the IMAGER. Also you can run this same test from the Mechanical Diagnostics screen in the SERVICE TOOL.

b. Check the Summary box for test results.

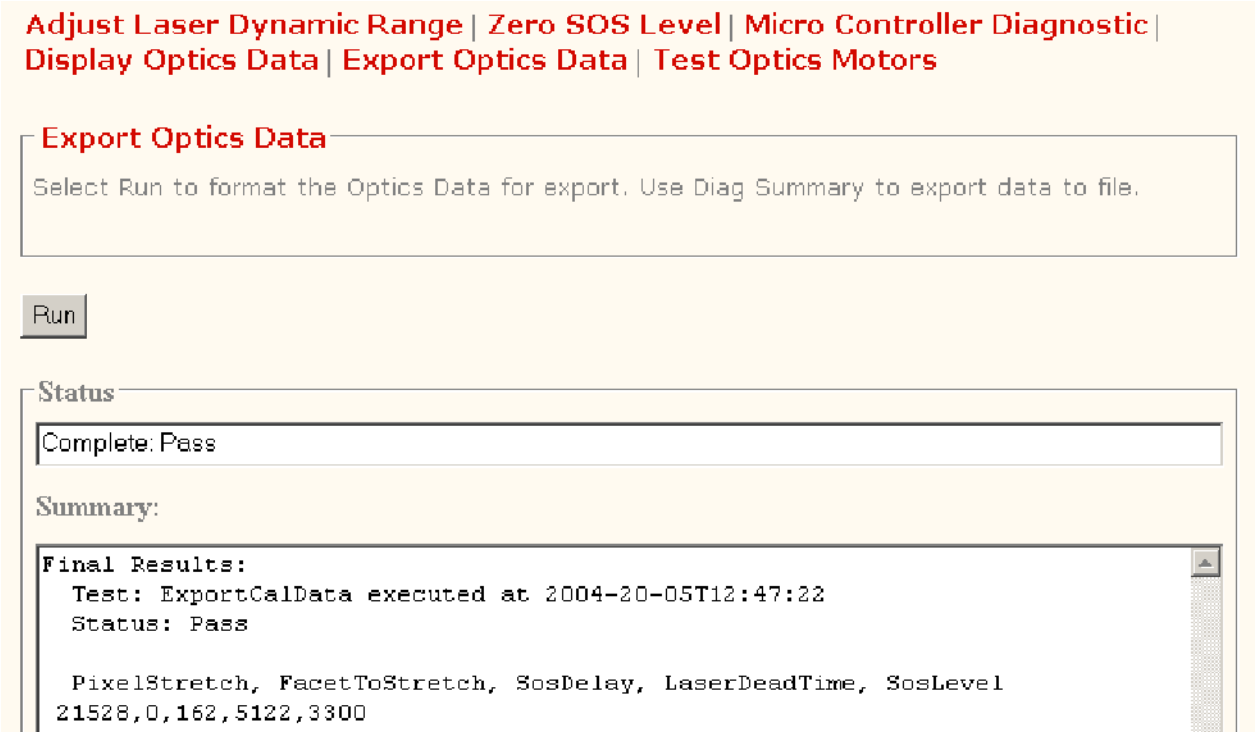
3. To display a summary of optics data from the last calibration, select **Display Optics Data**.

a. Click [Run].



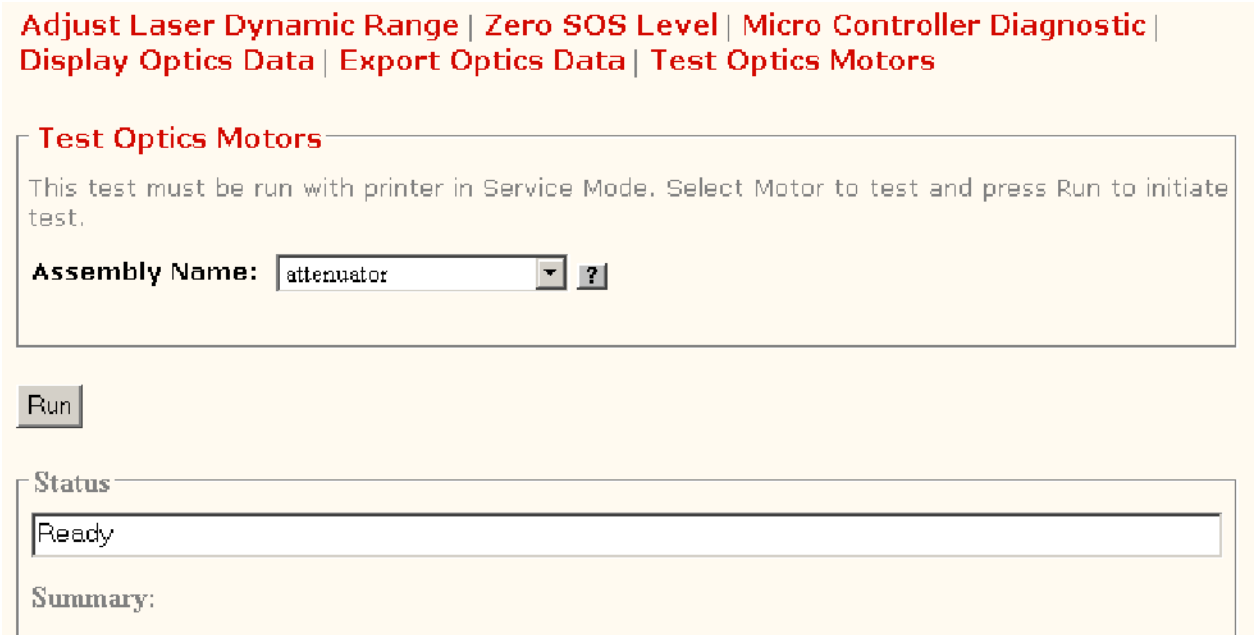
b. Check the Status and Summary boxes on the screen.

4. To export the optics data to a file on your LAPTOP COMPUTER, select **Export Optics Data**.
   a. Click [Run] to display the optics data.


Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Export Optics Data
Select Run to format the Optics Data for export. Use Diag Summary to export data to file.
Run
Status
Complete: Pass
Summary:
Final Results:
Test: ExportCalData executed at 2004-20-05T12:47:22
Status: Pass
PixelStretch, FacetToStretch, SosDelay, LaserDeadTime, SosLevel
21528,0,162,5122,3300

   b. From the main menu of the SERVICE TOOL, select **Diagnostics>Diag Summary** to export the optics data to your LAPTOP COMPUTER. See paragraph 7-2-15.

5. To test the Optics Motors, select **Test Optics Motors**. (This test can also be run from the Mechanical Diagnostics screen in the SERVICE TOOL.)


Adjust Laser Dynamic Range | Zero SOS Level | Micro Controller Diagnostic |
Display Optics Data | Export Optics Data | Test Optics Motors
Test Optics Motors
This test must be run with printer in Service Mode. Select Motor to test and press Run to initiate test.
Assembly Name:
attenuator
?
Run
Status
Ready
Summary:

   a. Set the SERVICE SWITCH in the Service position.

b. Select the MOTOR you wish to test from the **Assembly Name** dropdown menu. The selections include:
   - Attenuator Motor
   - Translation Motor
   - Move Translation to Ship – This operation moves the OPTICS MODULE into the shipping position.

c. Click [Run] to test the selected motor.

d. Check the Status and Summary boxes on the screen

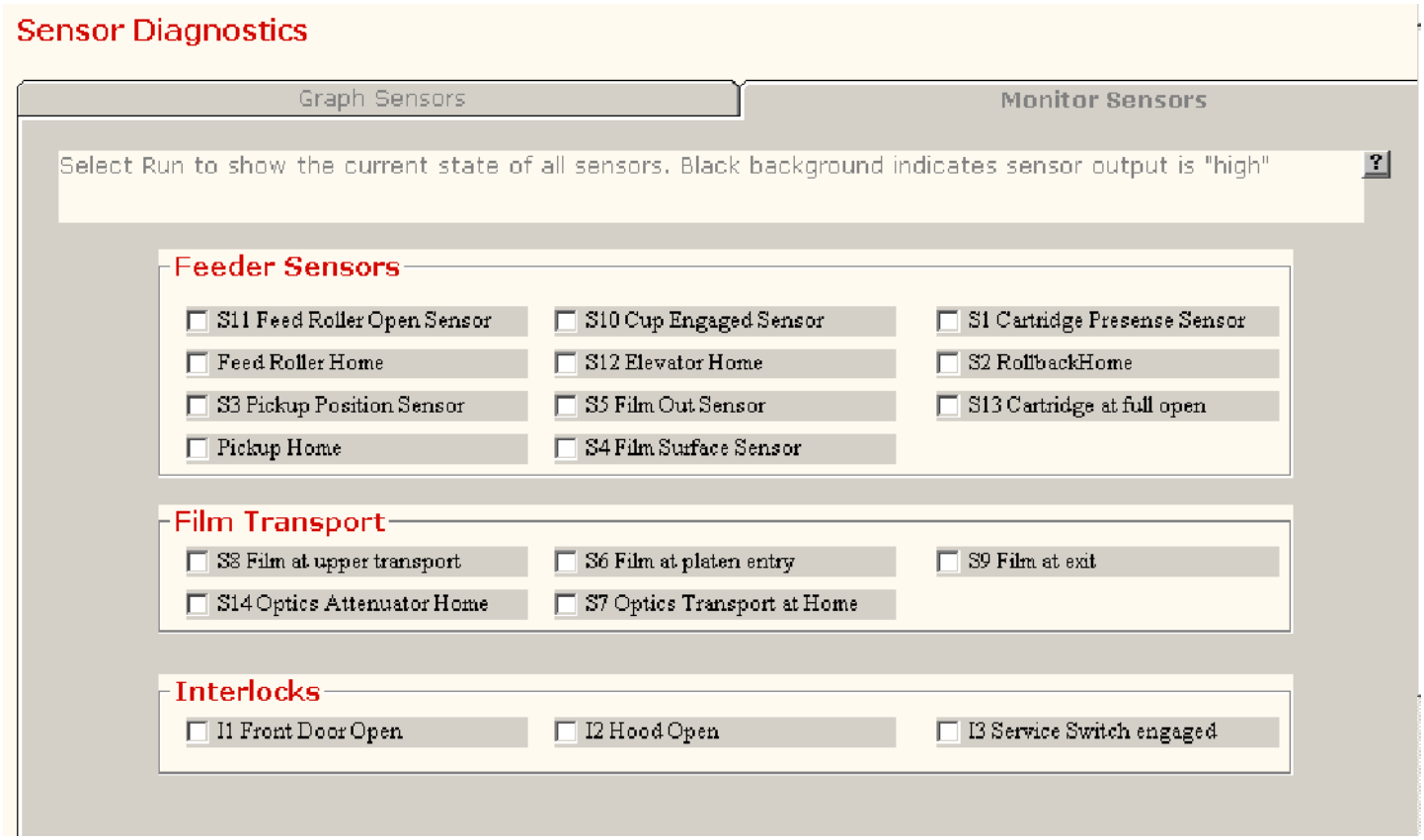
e. After completing the test, set the SERVICE SWITCH in the User position.

7-2-8. Testing the SENSORS

Note

The system SENSORS can also be tested by means of LEDs and JUMPERS on the CIRCUIT BOARDS. See paragraph 7-5.

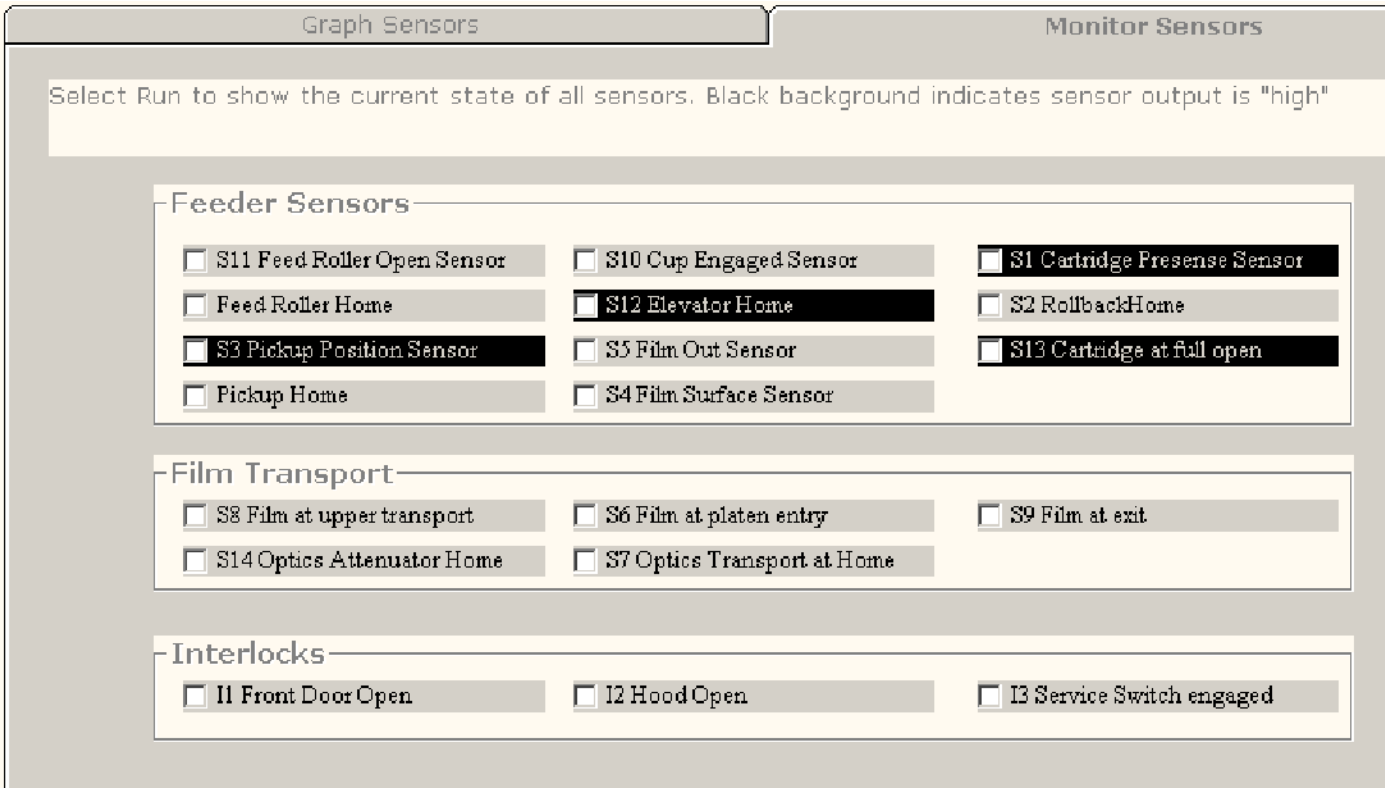
1. From the main menu of the SERVICE TOOL, select **Diagnostics>MCS>Sensor State** to test the SENSORS in the IMAGER.



2. To check the current state of all SENSORS in the IMAGER, click [Run] on the 'Monitor Sensors" screen.

Note

A black background indicates that the SENSOR state is high (or the INTERLOCK is closed).

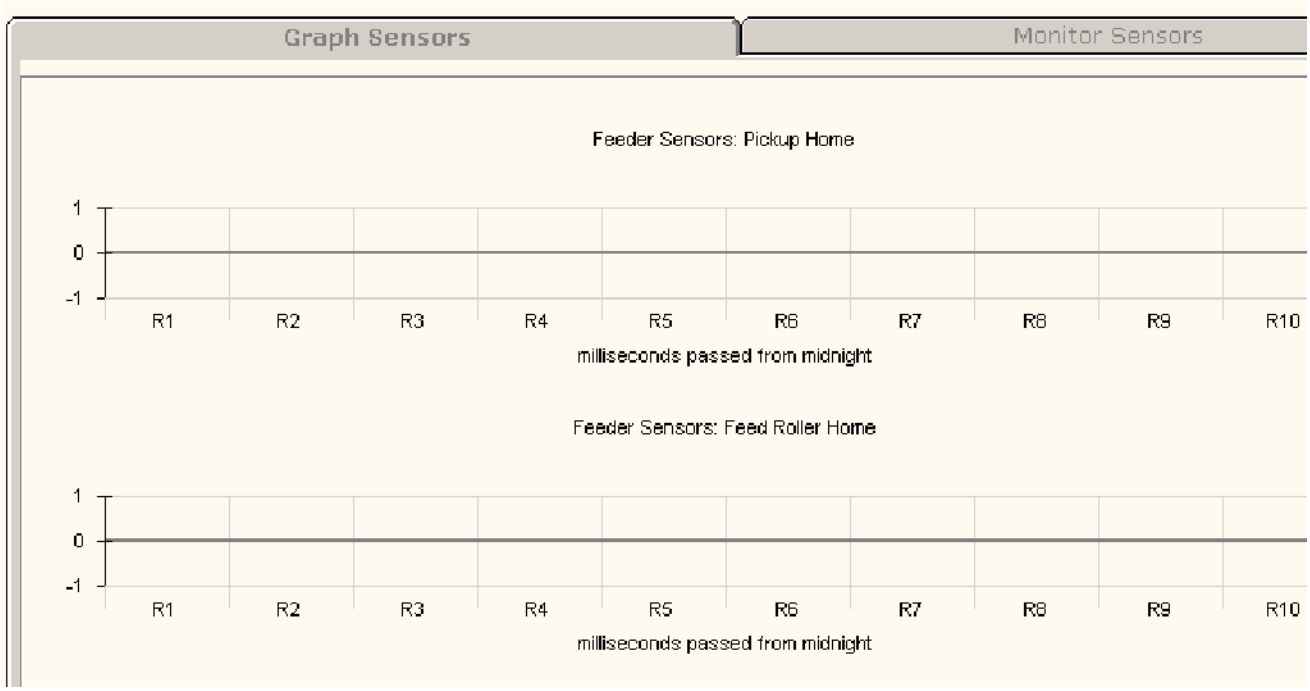

Graph Sensors
Monitor Sensors
Select Run to show the current state of all sensors. Black background indicates sensor output is "high"
Feeder Sensors
S11 Feed Roller Open Sensor
S10 Cup Engaged Sensor
S1 Cartridge Presense Sensor
Feed Roller Home
S12 Elevator Home
S2 RollbackHome
S3 Pickup Position Sensor
S5 Film Out Sensor
S13 Cartridge at full open
Pickup Home
S4 Film Surface Sensor
Film Transport
S8 Film at upper transport
S6 Film at platen entry
S9 Film at exit
S14 Optics Attenuator Home
S7 Optics Transport at Home
Interlocks
I1 Front Door Open
I2 Hood Open
I3 Service Switch engaged

Note

The screen above shows the normal state of the SENSORS in the IMAGER while film is not in transit.

3. If you wish to temporarily stop monitoring:
   - Click [Pause] to stop monitoring.
   - Click [Resume] to resume monitoring.
4. To discontinue monitoring the SENSORS, click [Stop].
5. To monitor the SENSORS while film is moving through the IMAGER:
   a. From the main menu of the SERVICE TOOL, select **Diagnostics>Test Prints>MCS Transport**.
   b. Return quickly to the “Monitor Sensors” screen and click [Run].
   c. Observe the “Monitor Sensors” screen to see changes in the state of the SENSORS.
6. To see a plotted graph of the operation of up to 3 selected SENSORS:
   a. To start a test print, select **Diagnostics>Test Prints>MCS Transport**.
   b. Return quickly to the “Monitor Sensors” screen and select (by checking) the SENSOR (or SENSORS) you wish to monitor.
   c. Click the “Graph Sensors” tab.
   d. Click [Run].

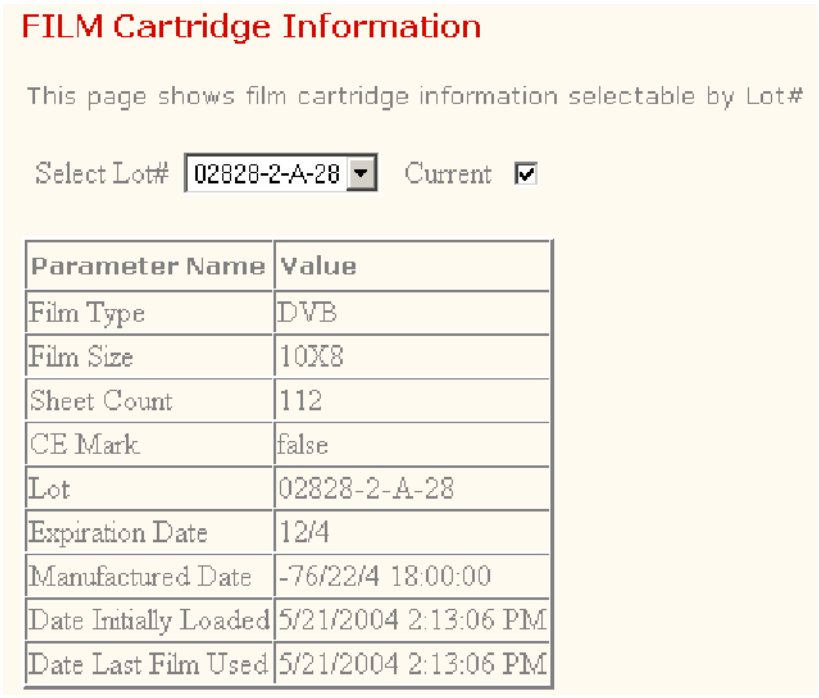
e. Observe the screen.



7-2-9. Obtaining Film Data

This procedure obtains information from the RF TAG about the film loaded in the IMAGER.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MIS>Cartridge Info**.


FILM Cartridge Information
This page shows film cartridge information selectable by Lot#
Select Lot# 02828-2-A-28
Current

Parameter Name	Value
Film Type	DVB
Film Size	10X8
Sheet Count	112
CE Mark	false
Lot	02828-2-A-28
Expiration Date	12/4
Manufactured Date	-76/22/4 18:00:00
Date Initially Loaded	5/21/2004 2:13:06 PM
Date Last Film Used	5/21/2004 2:13:06 PM

2. To display information about the film currently loaded in the IMAGER, check the “Current” box.
3. To display information about film previously loaded in the IMAGER:

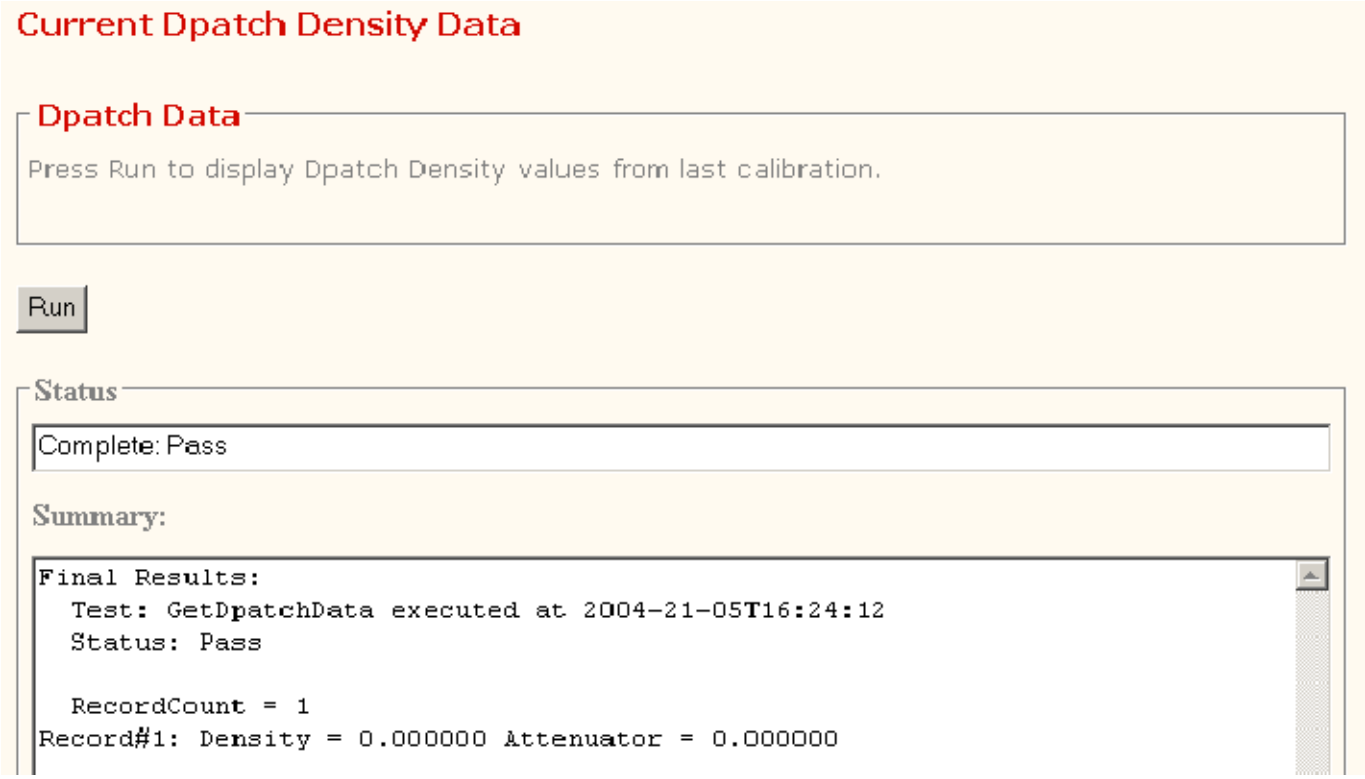
a. Uncheck the “Current” box.

b. Select the Lot Number of the film from the “Select Lot#” dropdown menu.

7-2-10. Obtaining Dpatch Data

This procedure obtains the density of the Dpatch from the last film calibration, if the film contained a Dpatch.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MIS>Dpatch**.
2. Click [Run].



3. Check Status (”Pass” or “Fail”) and the Summary.

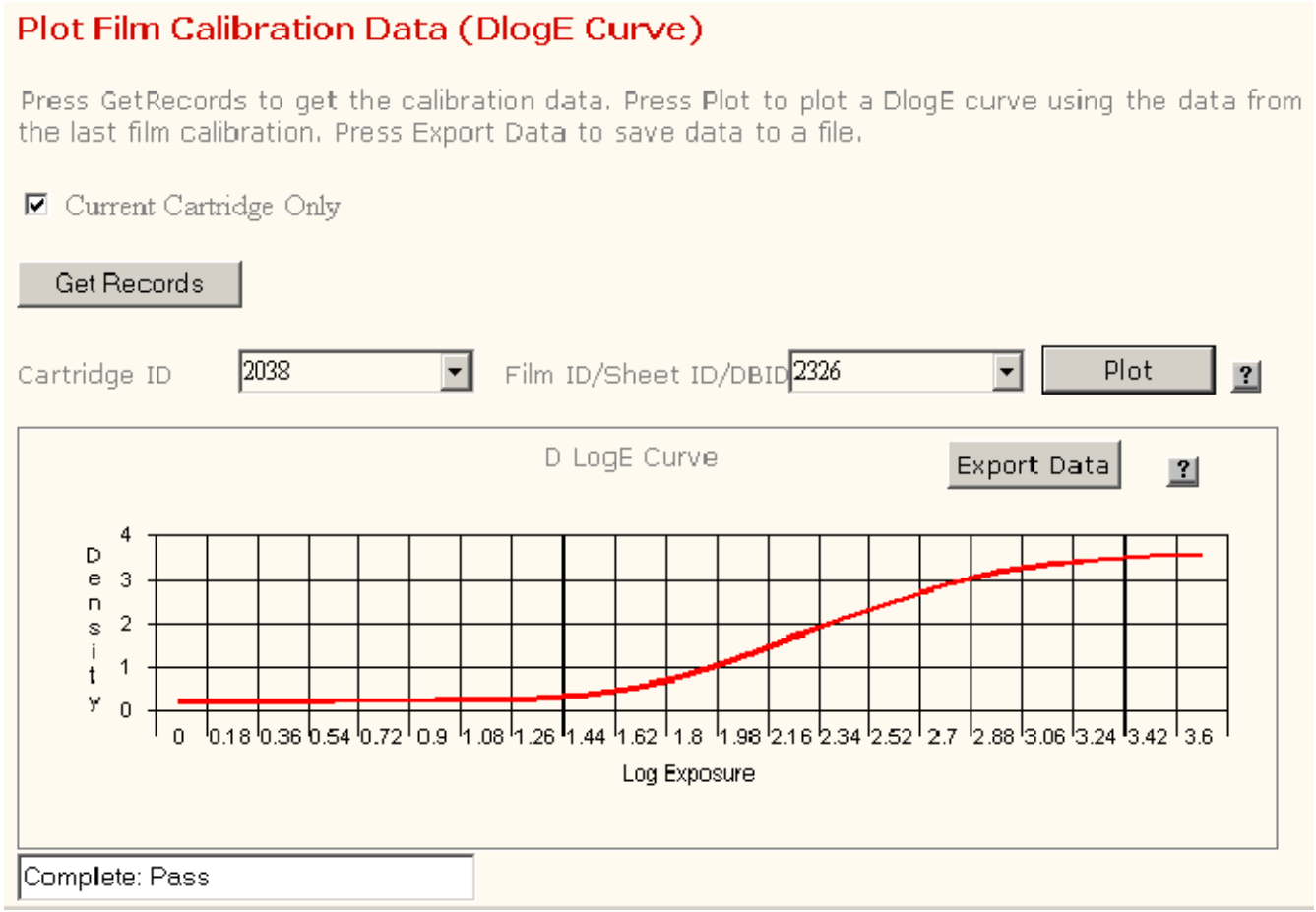
Note

The Summary will include the Density of the Dpatch and the ATTENUATOR setting that achieved this density value. Dpatch density must be between 0.7 and 1.3. The values are zero in the above example because the film did not use a Dpatch.

7-2-11. Plotting Film Calibration Data

This procedure plots a DLogE curve of the characteristics of the film from data stored from the last calibration of the film.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>MIS>Film Calibration**.

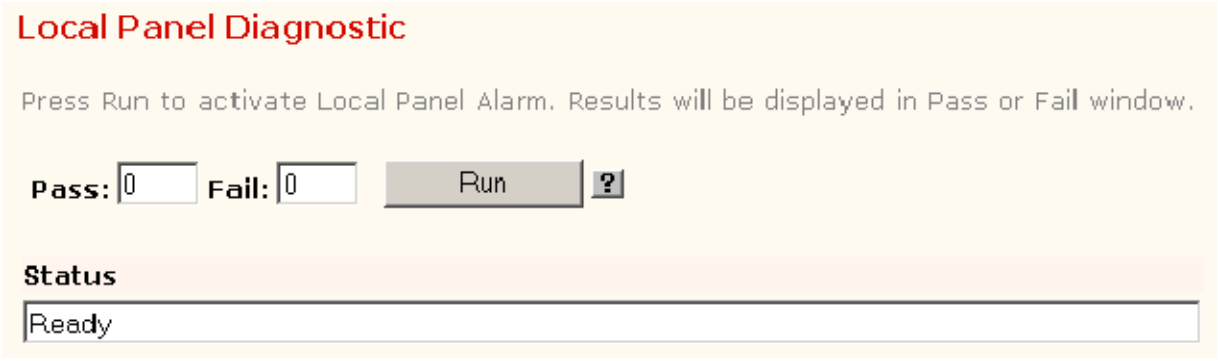

Plot Film Calibration Data (DlogE Curve)
Press GetRecords to get the calibration data. Press Plot to plot a DlogE curve using the data from the last film calibration. Press Export Data to save data to a file.
Current Cartridge Only
Get Records
Cartridge ID
2038
Film ID/Sheet ID/DBID
2326
Plot
?
D LogE Curve
Export Data
?
Density
4
3
2
1
0
0 0.18 0.36 0.54 0.72 0.9 1.08 1.26 1.44 1.62 1.8 1.98 2.16 2.34 2.52 2.7 2.88 3.06 3.24 3.42 3.6
Log Exposure
Complete: Pass

2. Click [Get Records]. The Cartridge ID and Film ID will display.
3. Click [Plot] to display a DLogE curve of characteristics of the film.
4. Click [Export Data] if you wish to save the DLogE curve to a folder in your LAPTOP COMPUTER.

7-2-12. Testing the LOCAL PANEL

This procedure tests basic functionality of the LOCAL PANEL by activating its Alarm (beeper). This checks whether the Alarm works, and also whether the DRE can communicate with the LOCAL PANEL.

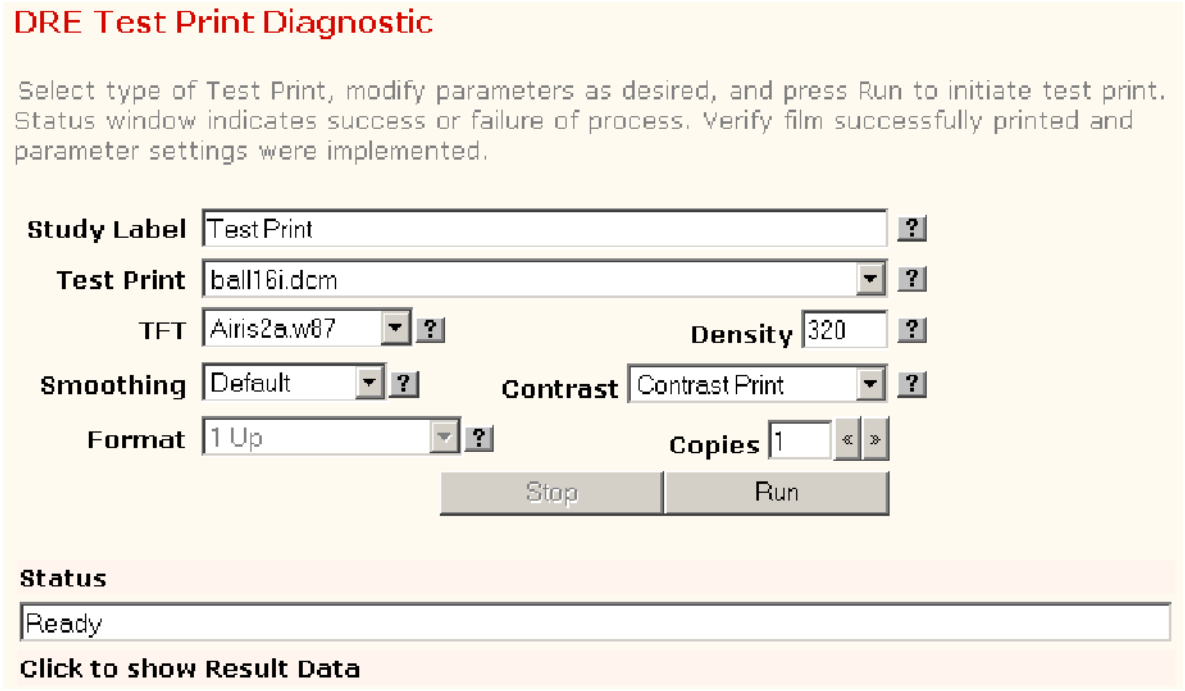
1. From the main menu of the SERVICE TOOL, select **Diagnostics>MIS>Local Panel Diagnostic**.



2. Click [Run].
3. Check that the Alarm sounds and that “Pass” is indicated.

7-2-13. Running a DRE Test Print

1. From the main menu of the SERVICE TOOL, select **Diagnostics>Test Prints>DRE Test Print**.

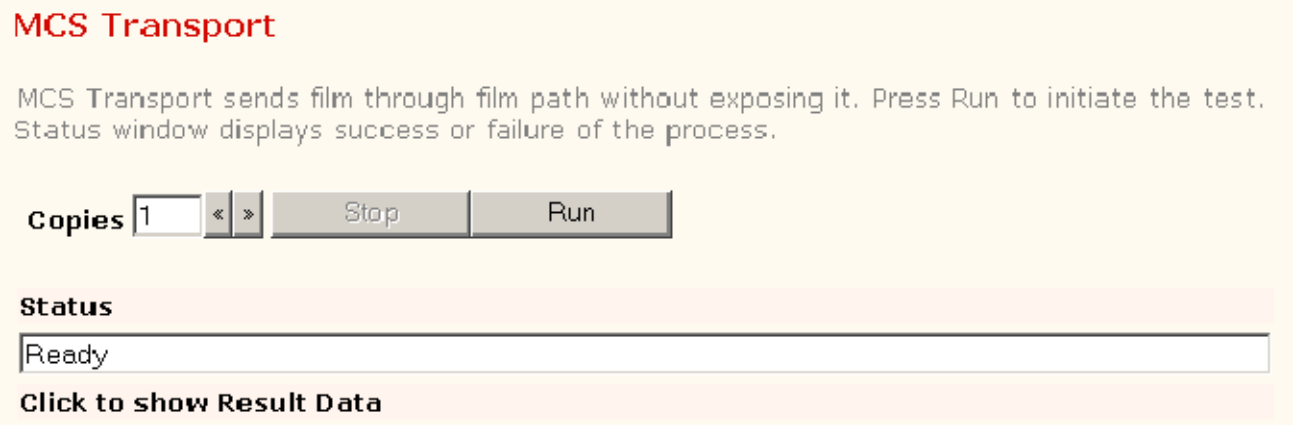


2. Select the parameters for the desired test print.
   a. In the “Study Label” window, type a name (up to 20 characters) for the print.
   b. From the “Test Print” dropdown menu, select the type of test print.
   c. Use the other dropdown menus to configure the test print image and select the number of copiers.
3. Click [Run].

7-2-14. Running an MCS Transport Test

This procedure runs film through the MCS without exposing it. It can be used to check operation of the film transport.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>Test Prints>MCS Transport**.

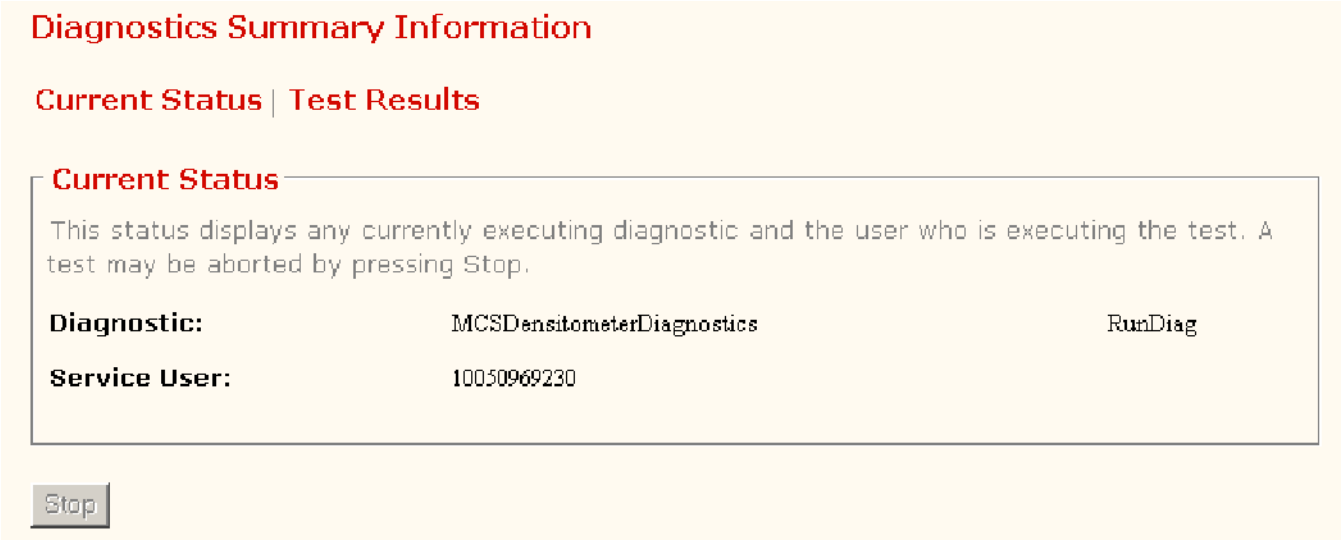


2. Use the “Copies” dropdown window to select the number of sheets of film you wish to run.
3. Click [Run].
4. If you wish to stop the process before all sheets are run, click [Stop].

7-2-15. Obtaining a Diagnostics Summary

This procedure will provide status of any diagnostic currently running in the IMAGER. It will also show the results of any diagnostic that has been run recently.

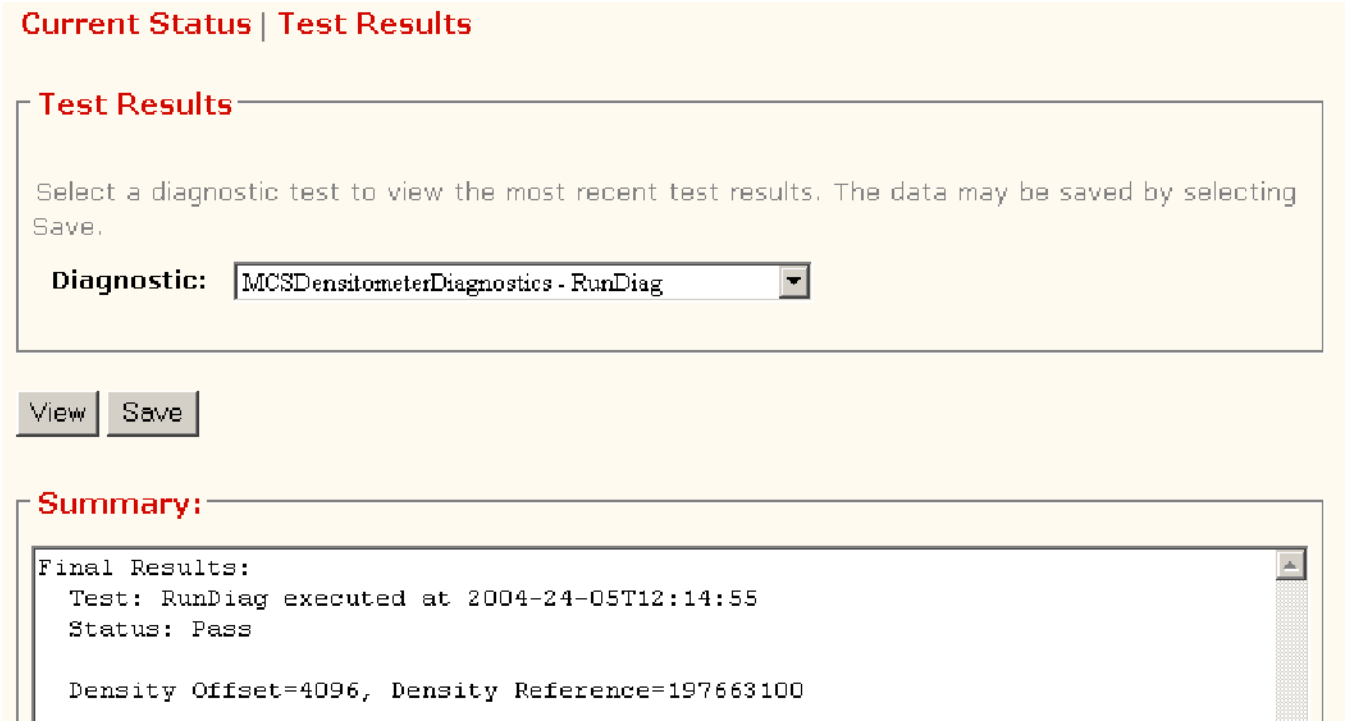
1. From the main menu of the SERVICE TOOL, select **Diagnostics>Diag Summary** to display “Current Status” of the diagnostics.


Diagnostics Summary Information
Current Status | Test Results
Current Status
This status displays any currently executing diagnostic and the user who is executing the test. A test may be aborted by pressing Stop.
Diagnostic:
MCSDensitometerDiagnostics
RunDiag
Service User:
10050969230
Stop

Note

If a Diagnostic is currently running, the name of the test and the insurance number of the user who requested it will display.

2. If you wish to abort a current test, click [Stop].
3. To display the results of a completed diagnostic, select “Test Results”.

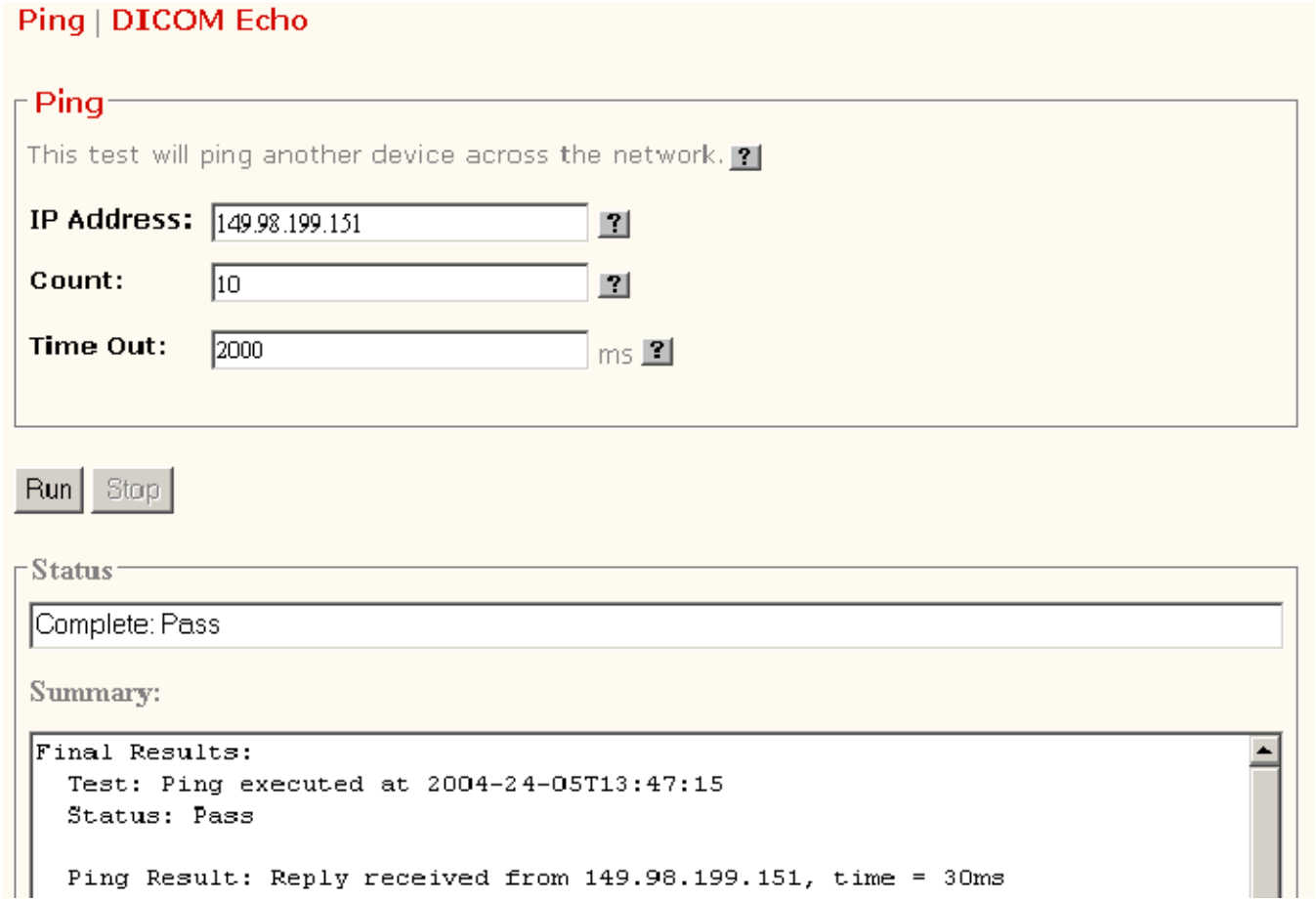


4. From the “Diagnostic” dropdown menu, select the name of the desired test.
5. To display a summary of the test results, click [View].
6. To save the summary to the HARD DRIVE of your LAPTOP COMPUTER, click [Save].
7. Store the file in a folder on your LAPTOP COMPUTER.

7-2-16. Testing Communication on the Network

The network communications tests include a Ping and a DICOM Echo test.

1. From the main menu of the SERVICE TOOL, select **Diagnostics>Network**.

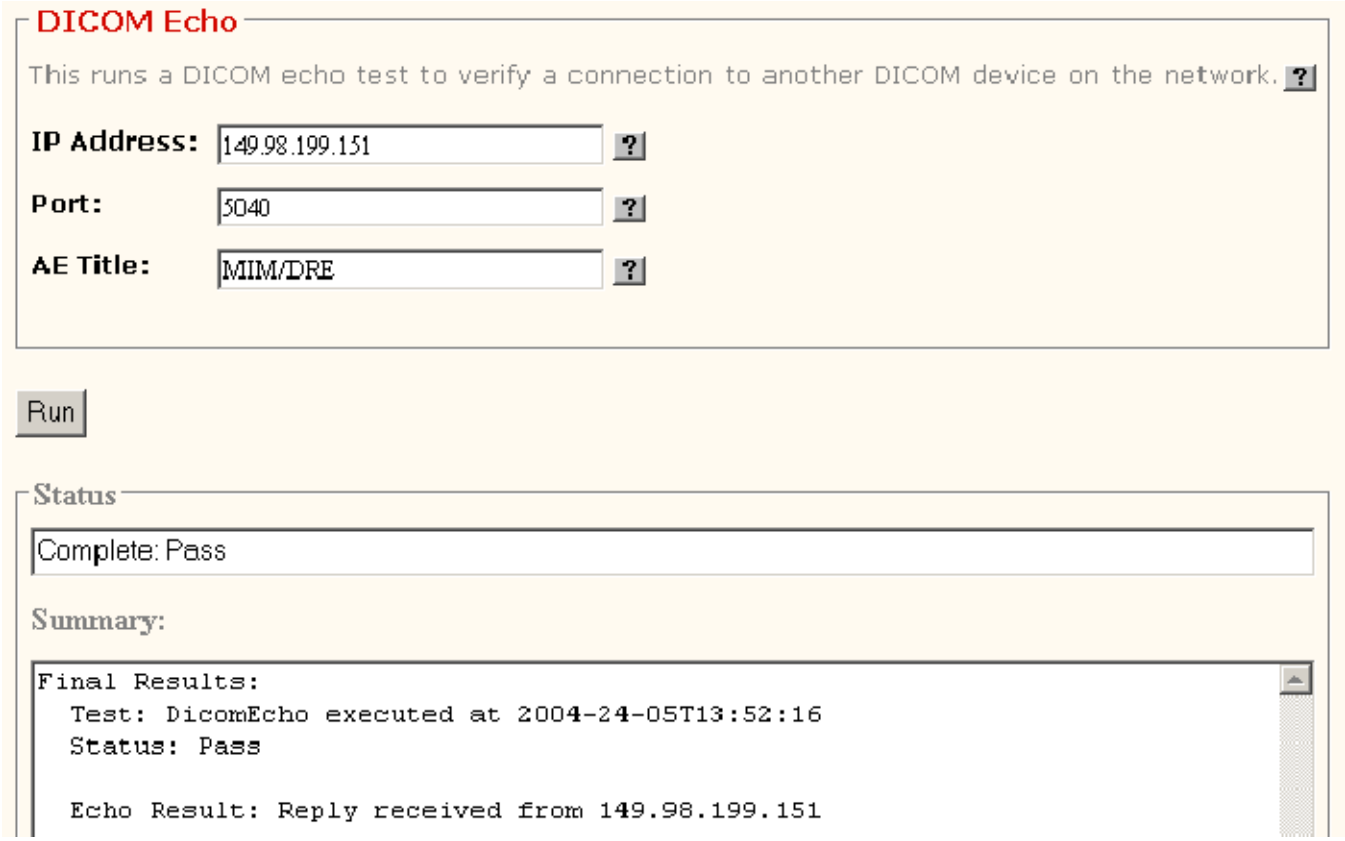


2. To run a “Ping” test to check that the IMAGER can contact other devices on the network:
   a. In the “IP Address” window, enter the IP Address of a device on the network.
   b. In the “Count” window, enter the number of pings you wish to be sent.
   c. In the “Time Out” window, enter the number of milliseconds to allow for a response before failing the test.
   d. Click [Run].
   e. Check for “Status” and a “Summary” of the test.

Note

You can also run a Ping test from the “Service” menu of the LOCAL PANEL.

3. To run a DICOM Echo test, select “DICOM Echo” from the Network Diagnostics screen.

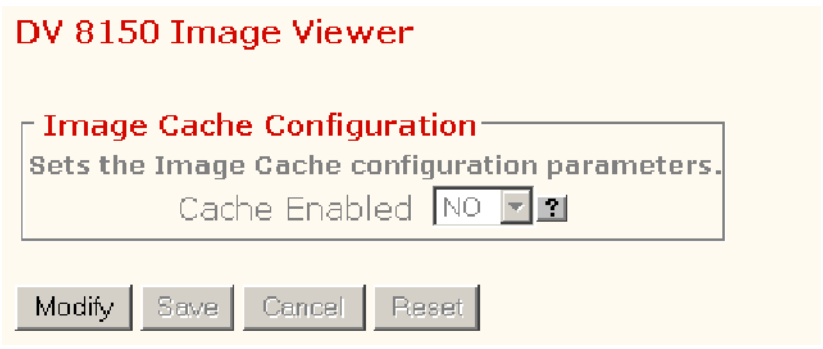


4. Enter the IP Address, Port Number, and AE Title of the device.
5. Click [Run].
6. Check for ’Status“ and a “Summary” of the test.

7-2-17. Troubleshooting the Source of Image Problems

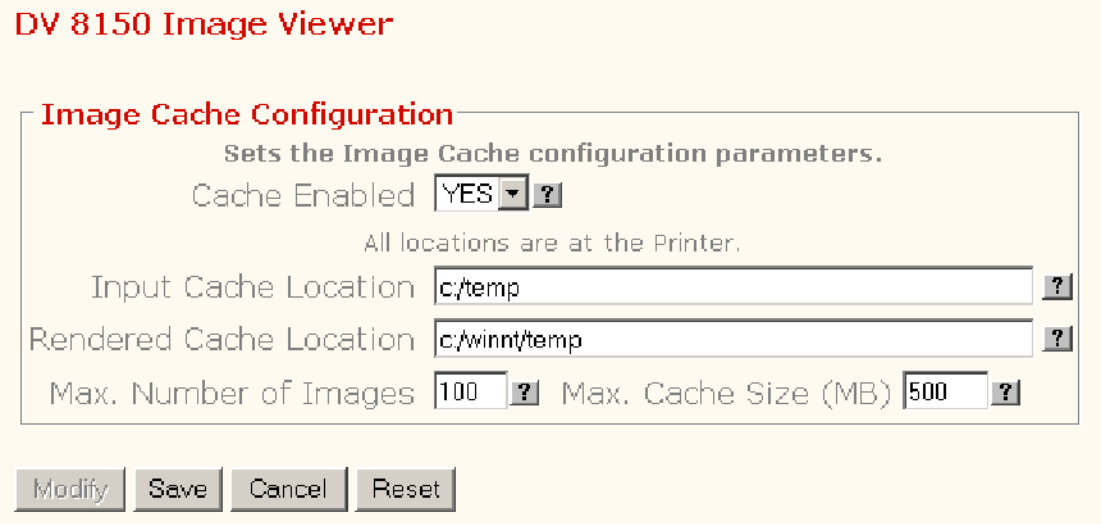
If you are experiencing image problems, you can use the SERVICE TOOL to save and display both the raw image from the MODALITY and the same image rendered in the DRE. These images can be compared with the image printed on film. This will help you to determine the source of the problem: MODALITY, DRE, or PCIO BOARD or MCS.

1. To set up the SERVICE TOOL for viewing images:
   a. From the main menu of the SERVICE TOOL, select **Diagnostics>Configure Image Viewer**.



b. Click [Modify].

c. In the “Cache Enabled” window, select **YES**.



d. In the “Input Cache Location” window, type the file location on the DRE HARD DISK (C:/temp) for storage of the raw image.

e. In the “Rendered Cache Location” window, type the file location on the DRE HARD DISK (C:/winnt/temp) for storage of the rendered image.

f. In the “Max. Number of Images” window, type the maximum number of images you wish to view (minimum value is 10, maximum value is 100).

g. In the “Max. Cache Size (MB)” window, type a size in megabytes for the storage area on DISK (minimum value is 100 MB, maximum is 200 MB, default is 500 MB).

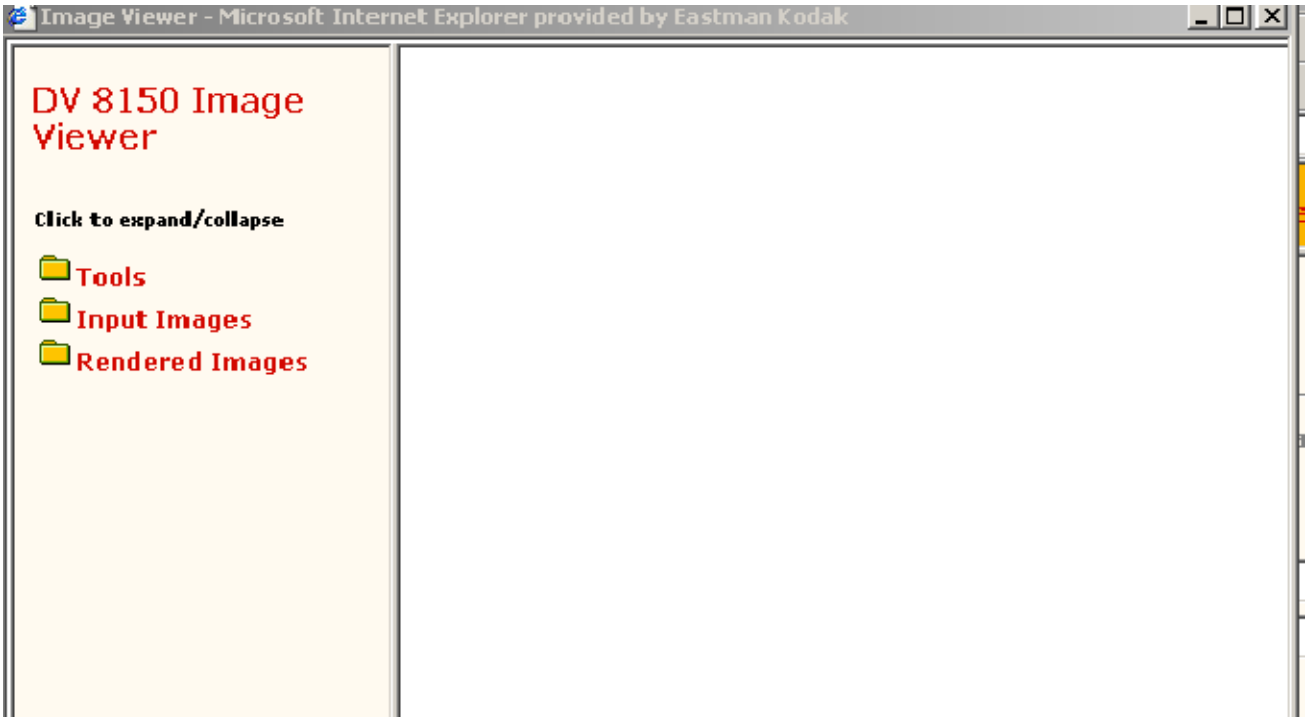
h. Click [Save].

Note

The “Image Cache” area on the DRE HARD DISK is now set up for storage of images sent down from the MODALITY. The storage area will remain enabled for 2 hours, and will capture all images received into the DRE The “raw” image is the DICOM image received into the PACSLink from the network. The “rendered” image is captured after rendering in the PACSLink Delivery Interface.

2. To view the images in the Image Cache:

a. On the main menu of the SERVICE TOOL, select **Monitoring>Image Viewer**.

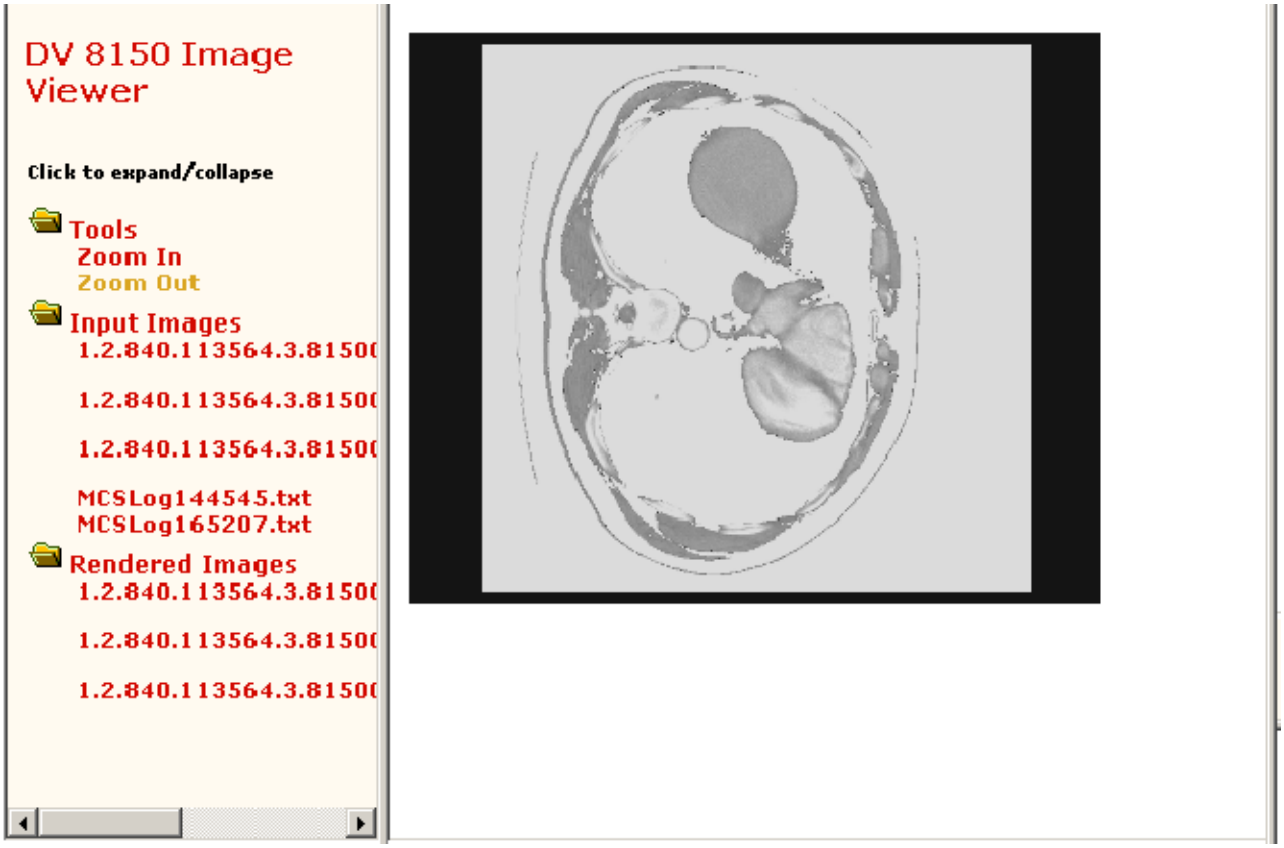


b. To view a “raw” image from the MODALITY, select “Input Images”.

c. Select (click) the desired image from the Input Images list.

d. Select “Tools” from the menu and click “Zoom Out” until the image is reduced to the screen size.

e. To view the “rendered” version of the same image, select “Rendered Images’ from the menu and repeat the procedures of steps c and d.



3. Compare the raw and the rendered versions of the same image.

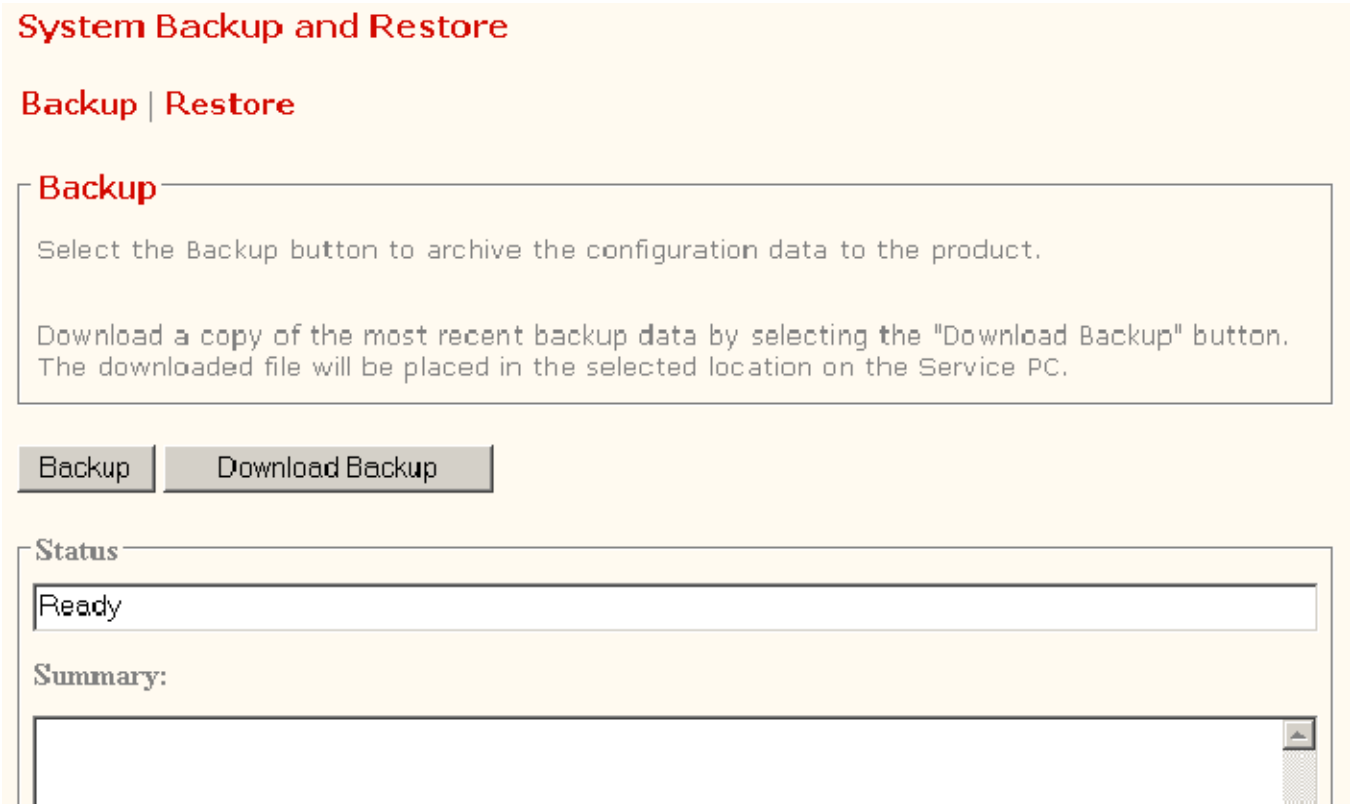
Note

The images should look the same, except for the border around the rendered image.

4. Compare the raw and rendered versions of the image to the print produced by the MCS.
5. If problems exist with printed images, use the following basic guidelines to determine the source of the error:
   - If the raw image is bad, suspect the MODALITY, the network, or the DICOM (network) subsystem of the DRE.
   - If the raw image is good and the rendered image is bad, suspect the Delivery (Interface) subsystem of the DRE.
   - If the raw and rendered images are good, but the print from the IMAGER is bad, suspect the PCIO BOARD, the MCS BOARD, or the OPTICS.

7-2-18. Configuration Backup

1. From the main menu of the SERVICE TOOL, select **Utilities>Backup / Restore**.


System Backup and Restore
Backup | Restore
Backup
Select the Backup button to archive the configuration data to the product.
Download a copy of the most recent backup data by selecting the "Download Backup" button.
The downloaded file will be placed in the selected location on the Service PC.
Backup
Download Backup
Status
Ready
Summary:

2. To store a backup of the configuration parameters on the DRE HARD DISK, click the [Backup] button.

Note

When the backup is completed, the “Summary” window will display results.

3. To download the configuration backup to a FLOPPY DISKETTE:
   a. Click [Download Backup].
   b. When the “Save Copy As” screen appears, select a folder on a FLOPPY DISKETTE in your LAPTOP COMPUTER.
   c. Click [Save].
4. Store the FLOPPY DISKETTE in the IMAGER.

7-2-19. Configuration Restore

1. From the main menu of the SERVICE TOOL, select **Utilities>Backup / Restore**.

System Backup and Restore
Backup | Restore
Restore
Restore archived configuration data from product. By default, the configuration will be restored from the most recent backup file on the product. To upload an archive from the service PC, check the "Upload Configuration File" checkbox and click the "Browse" button to select a file.
Upload Configuration File
Configuration File:
Browse...
Restore
Status
Ready
Summary:

2. Select “Restore” at the top of the screen.
3. Click the [Restore] button.
4. To upload the stored configuration data from a FLOPPY DISKETTE to the DRE:
   a. Place a check in the “Upload Configuration File” box.
   b. Click [Browse].
   c. When the “Choose File” screen appears, load the backup FLOPPY DISKETTE into your SERVICE LAPTOP.
   d. Select:
      - “3-1/2 Floppy”
      - The file name of the backup file.
   e. Click:
      - [Open]
      - [Restore]

7-2-20. Upgrading the DRE Software – “Ghosting”

This “generic” procedure is provided only for reference. The “ghosting” procedure will vary with each new software upgrade and will be provided in a MOD KIT, which also may contain firmware chips for upgrading the MCS firmware.

For this procedure you will need:

- A CD containing the DRE software (the ghost CD).
- A CD containing the LOCAL PANEL videos.

1. Connect your LAPTOP COMPUTER to the Service Port on the IMAGER.
2. Use SecureLink to connect to the IMAGER.
3. Open the Service Tool (Service WebLink).
4. Back up the Configuration Files to a FLOPPY DISKETTE as instructed in procedure 7-2-18.
5. Open the FRONT DOOR of the IMAGER.
6. Remove the FILM CARTRIDGE.
7. Open the DRE DOOR.
8. Insert the DRE software CD into the CD-ROM DRIVE of the IMAGER.
9. Shutdown the IMAGER and turn off the POWER SWITCH on the back of the IMAGER.
10. Turn on the POWER SWITCH to restart the IMAGER.

    Software loading (ghosting) starts after the IMAGER boots up from the CD−ROM DRIVE and lasts for about 8 minutes. A message will appear on the LOCAL PANEL when software loading is complete.

Note

In the ghosting process, the language selection is reset to English and the Service Passcode reverts to the factory setting (123456).

11. Remove the DRE software CD from the CD-ROM DRIVE.
12. Turn off the IMAGER using the POWER SWITCH .
13. Turn on the POWER SWITCH. The IMAGER should start up normally and display the “Select Language” screen on the LOCAL PANEL.
14. Select the desired language for your location. Refer to paragraph 2-6-8 in Section 2 of this manual.
15. Change the Service Passcode from the factory setting (123456). Refer to paragraph 2-6-8 in Section 2 of this manual.
16. Restore the configuration parameters: Follow procedure 7-2-19 on page 7-31.
17. Load LOCAL PANEL videos:
    a. Insert the video CD in the CD ROM DRIVE of the IMAGER.
    b. Close the DRE DOOR.
    c. Close the FRONT DOOR.
    d. Reconnect to the Service WebLink
    e. From the Main Menu of the SERVICE TOOL, select **Diagnostics>Scripts**.
    f. Select “Remote”
    g. Highlight “CopyLPVideos.vbs” and select Run.

h. Select the “ScriptRunTime” tab.
   - Loading will take about 4 to 5 minutes.
   - When loading is complete, the word “Pass” is displayed in the Service WebLink window.

18. Open the FRONT DOOR.
19. Open the DRE DOOR.
20. Remove the video CD and close the DRE DOOR.
21. Insert a FILM CARTRIDGE.
22. Close the FRONT DOOR.
23. If RMS was enabled on this IMAGER, you will need to restart RMS:
    a. In the Service Weblink, select “Configuration > System > Remote Monitoring”
    b. Click [Modify]
    c. Click [Save]
    d. Click [Start Service]
24. Verify RMS registration:
    - Refer to paragraph 2-6-11 in Section 2.
    - Perform steps 1 through16 of the RMS Grouping procedure.
25. Reload the MPDB (Modality Preferences Data Base). See the procedure below.

7-2-21. Reloading the MPDB through RMS

This process is used at sites with RMS to install the MPDB update after the update has been downloaded from ACMS.

1. Launch the RMS Main Screen and log in (https://qss.kodak.com/qss/login.jsp).
2. Under Groups, expand Remote System Managers.
3. Locate the region, area/country and hospital.
4. Click the hospital folder.
5. The devices located at the selected hospital will display on the screen.
6. Click the device SA □(e.g. K8150xxx.USA.8150xxx.SA).
7. Click the Device Explorer Popup icon to display two screens.
8. Under File Transfer, click **Upload**.
9. Click **Local**.
10. Next to the Select File box, click **Browse** to locate the MPDB update file on your hard drive. The file will be at the location where it was downloaded from ACMS. Refer to ACMS Query.
11. Select the file.
12. Click **Open**.
13. The file name appears in the Select File box.

14. Click **Upload**. The progress bar at the bottom of the screen indicates the uploading progress.

15. A new screen displays the selected file name and path in the Systems File–Filter window.

16. Under File Transfer, click **Download**.

17. In the System File Name window, locate the file. Check the box in front of the file name.
    Scroll down to the bottom of the screen and click Download to place the file in the ES repository.
    When the File Download window indicates that the file download has been submitted, click **OK**.

18. Under Summary, click **View** to verify that the file is in the ES repository.

19. Check that the Pending Messages/File Repository box contains a date and time (EST) for the generated file. Change the refresh interval to 5 seconds and click Start Auto Refresh.
    After the file has been downloaded, the Pending Messages box will indicate that there are no pending messages.

20. Select **Administration**>**System tabs** and click **System Log** to display error messages. If there is a downloading error, contact RMS Support or wait and try again.

21. Select **Applications**>**Diagnostics tabs**.

22. Under Properties, click **Get Values**.

23. In the Readable Properties window, check the **Property** box. Click **Request**.

24. Change the refresh interval to 5 seconds and click **Start Auto Refresh**. Under Remote Access, click **Connect to Device**.

25. The Remote Access screen appears. Wait for Status column entries to display □Completed□.

26. Click **Connect SecureLink**.

27. Click **OK** (no user name or password is needed).

28. The Secure Link Password screen appears. Enter the Secure Link password.

29. Enter the IP Address (127.0.0.1) in the IP Address box of the Secure Link screen.

30. Enter the port number displayed on the Remote Access Session screen (5959) into the Port box of the Secure Link screen.

31. Click **Connect** to connect Secure Link to the Imager. The connection icon indicates that the Secure Link connection to the Imager has been completed.

32. Launch the WebLink 8150 Service Tool. Select **Diagnostics**>**Scripts**.

33. On the Scripts page, click **Local**. Browse to the local copy of the TriggerMPDB.vbs file and highlight the file. This file is provided on your laptop to enable you to perform this process.

34. Click **Open** and click **Run**.

35. Select the Scripts RunTime tab.A “Pass” message appears when the file has been copied to trigger.enca. If the ACMS Query did not provide the required modality parameters, configure the Imager by manually entering the parameters using the Modality Parameter Values Capture process.

7-3. Using Power-On Self-Test as a Troubleshooting Tool

Each time power is applied to the IMAGER, a self test of major MCS functions occurs, followed by calibration of the LASER OPTICS. A knowledge of the sequence and timing of this process can be a valuable aid in trouble analysis. Self test occurs normally without user intervention. However, as described in the following paragraph, you can “open” the IMAGER before applying power so that you can observe the self-test process in the MACHINE. The following pages provide flow charts of the major self-test functions and indicate the timing of individual tests with respect to application of power to the SYSTEM.

7-3-1. Setting up for Observation of Self-Test

With power removed and a FILM CARTRIDGE loaded:

1. Open the FRONT DOOR and remove the REAR PANEL. (This will allow you to observe self test operations.)
2. Set the SERVICE OVERRIDE SWITCH in the Service position.

Note

The last procedure in the self-test sequence, the OPTICS/AIQC calibration and test, cannot occur with the SERVICE OVERRIDE SWITCH set in the Service position. The program will skip this test and change to a Ready state after performing the rest of the tests. At this point you should turn off SYSTEM power, set the Service Override to the Normal position, replace the REAR PANEL, close the FRONT DOOR, and energize the IMAGER to repeat the sequence. This time *all* tests will sequence.

7-3-2. Initialization and Self-Test Sequence Flow Charts

The following flow charts illustrate the sequence of initialization and self-test::

- Figure 7-3. MCS Initialization and Self-Test Startup
- Figure 7-4. Film Clearing Process
- Figure 7-5. FILM FEEDER MODULE Diagnostics, including:
  - PICKUP ASSEMBLY Checks (Sheet 1)
  - FILM FEED ROLLER, FILM FEED MOTOR, VACUUM PUMP and ELEVATOR Checks (Sheet 2)
  - ROLLBACK and CUPS ENGAGED SENSOR Checks (Sheet 3)
- Figure 7-6. RF TAG SUBSYSTEM Diagnostics
- Figure 7-7. DENSITOMETER MODULE Diagnostics
- Figure 7-8. OPTICS MODULE Diagnostics
- Figure 7-9. OPTICS (AIQC) Calibration and Testing

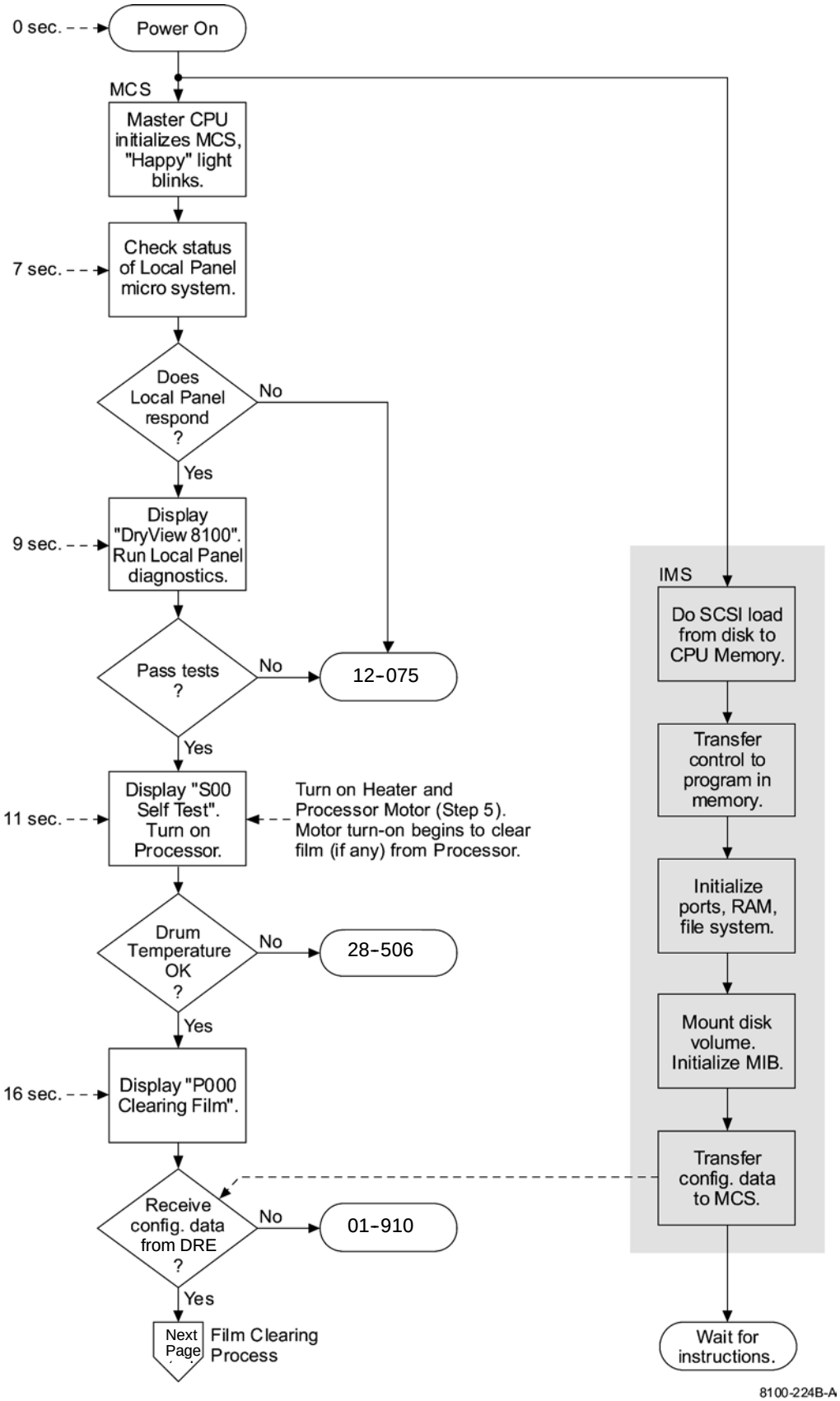


Figure 7-3. MCS Self-Test Startup

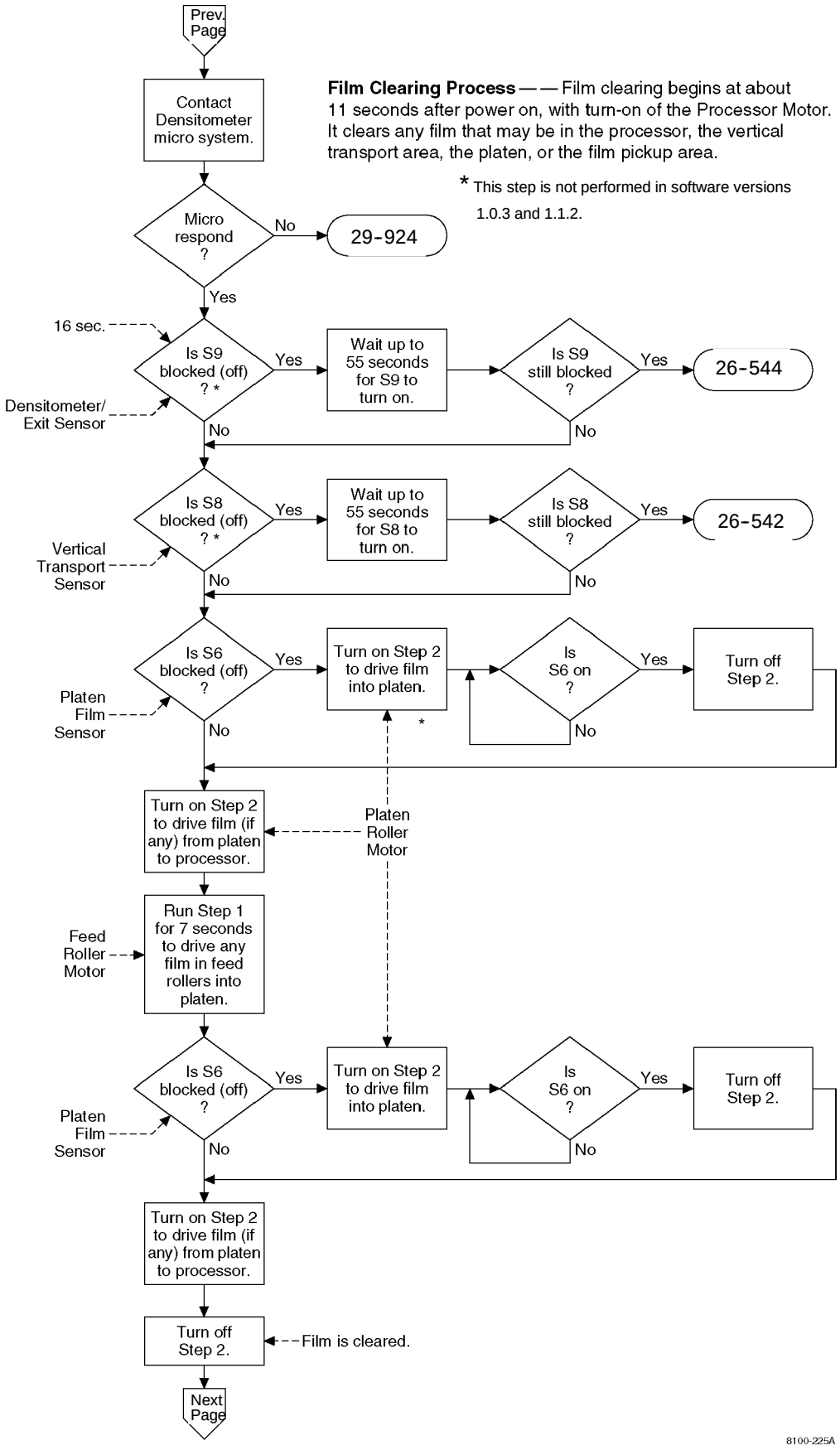
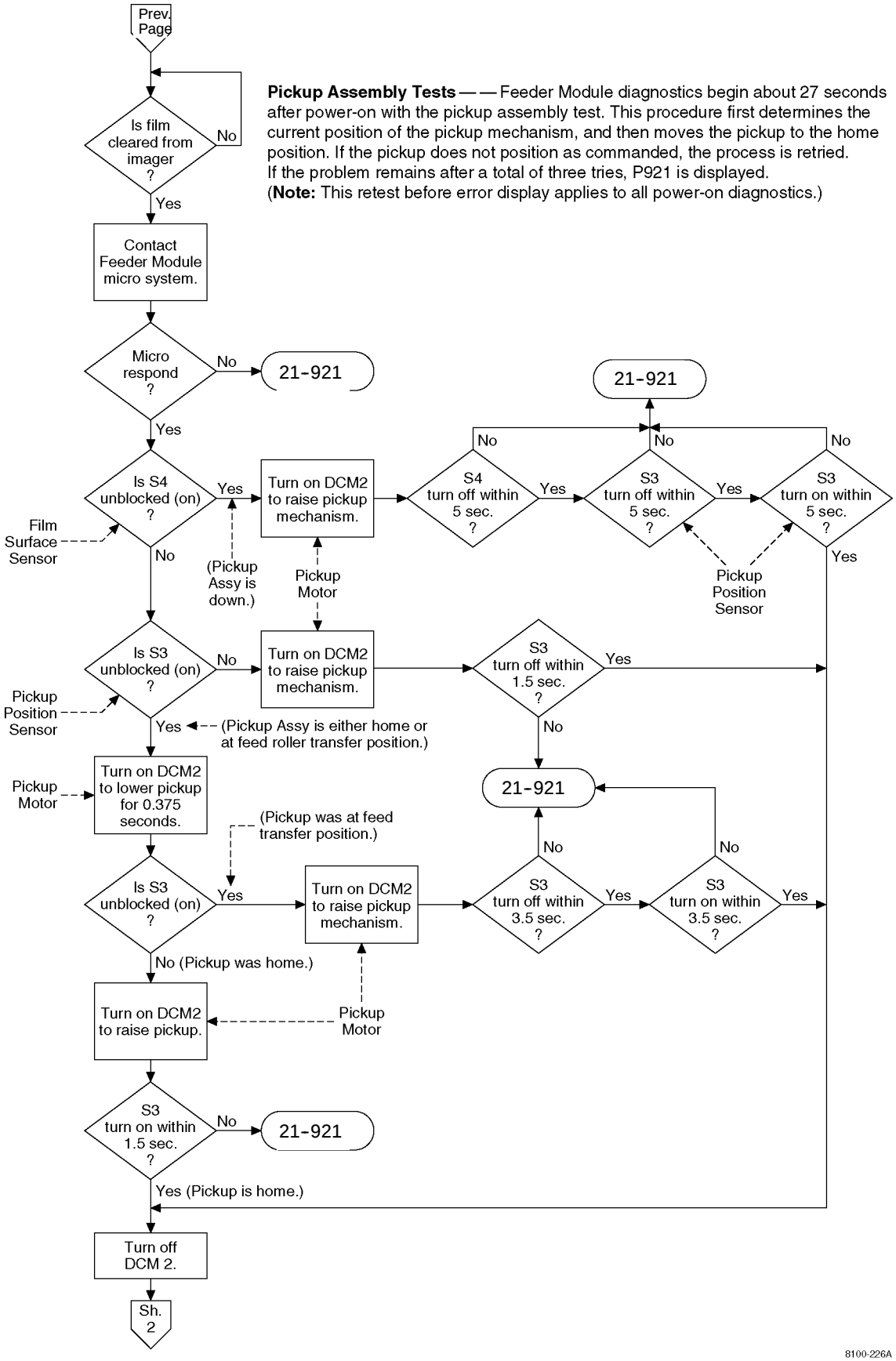

Prev. Page
Contact Densitometer micro system.
Film Clearing Process — — Film clearing begins at about 11 seconds after power on, with turn-on of the Processor Motor. It clears any film that may be in the processor, the vertical transport area, the platen, or the film pickup area.
* This step is not performed in software versions 1.0.3 and 1.1.2.
Micro respond ?
No
29-924
Yes
16 sec.
Is S9 blocked (off) ? *
Yes
Wait up to 55 seconds for S9 to turn on.
Is S9 still blocked ?
Yes
26-544
Densitometer/ Exit Sensor
No
No
Is S8 blocked (off) ? *
Yes
Wait up to 55 seconds for S8 to turn on.
Is S8 still blocked ?
Yes
26-542
Vertical Transport Sensor
No
No
Is S6 blocked (off) ?
Yes
Turn on Step 2 to drive film into platen.
Is S6 on ?
Yes
Turn off Step 2.
Platen Film Sensor
No
*
No
Turn on Step 2 to drive film (if any) from platen to processor.
Platen Roller Motor
Run Step 1 for 7 seconds to drive any film in feed rollers into platen.
Feed Roller Motor
Is S6 blocked (off) ?
Yes
Turn on Step 2 to drive film into platen.
Is S6 on ?
Yes
Turn off Step 2.
Platen Film Sensor
No
No
Turn on Step 2 to drive film (if any) from platen to processor.
Turn off Step 2.
Film is cleared.
Next Page
8100-225A

Figure 7-4. Film Clearing Process



Pickup Assembly Tests — — Feeder Module diagnostics begin about 27 seconds after power-on with the pickup assembly test. This procedure first determines the current position of the pickup mechanism, and then moves the pickup to the home position. If the pickup does not position as commanded, the process is retried. If the problem remains after a total of three tries, P921 is displayed. (**Note:** This retest before error display applies to all power-on diagnostics.)

Figure 7-5. FILM FEEDER MODULE Diagnostics (Sheet 1)

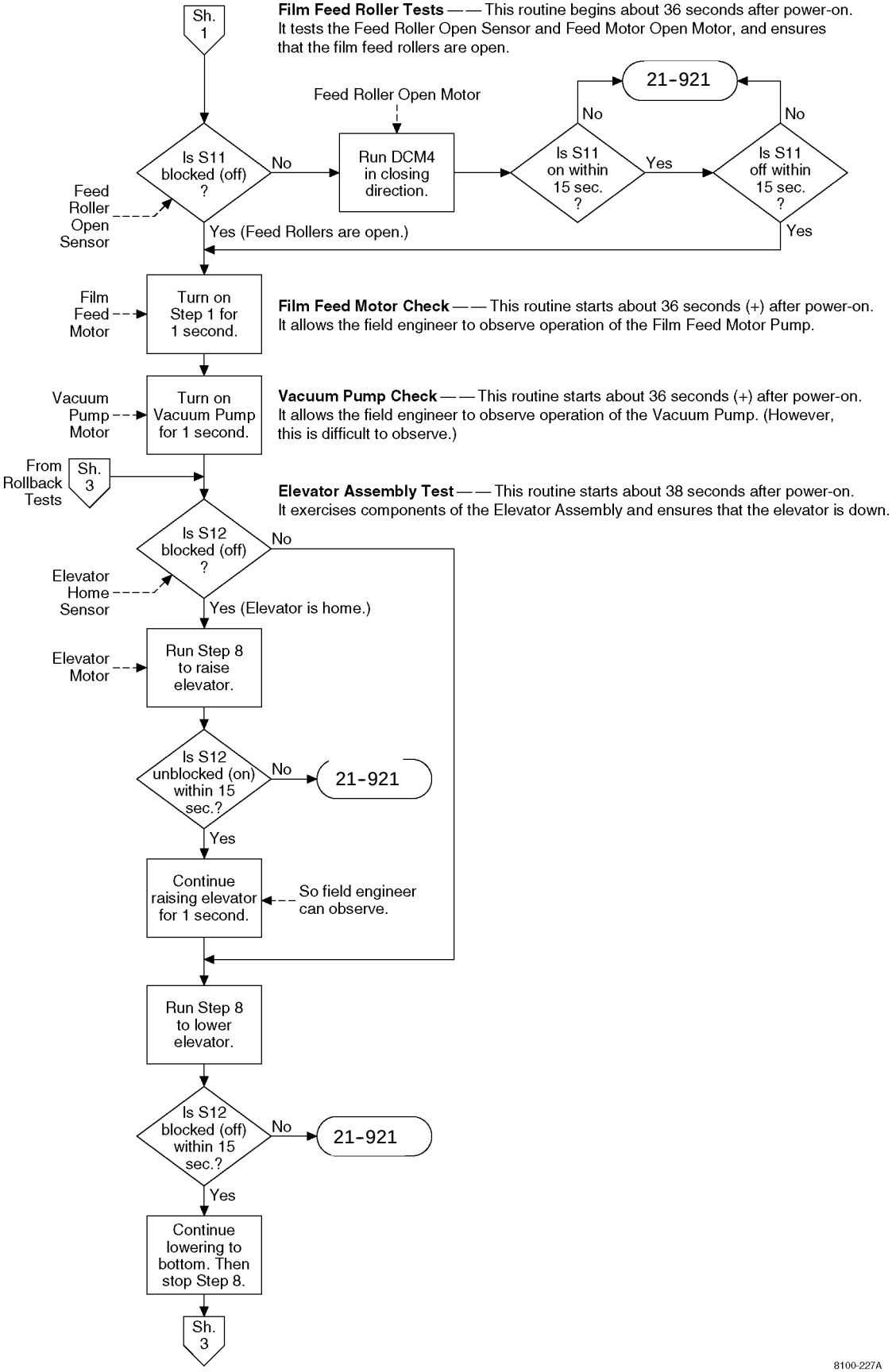

Sh. 1
Film Feed Roller Tests — — This routine begins about 36 seconds after power-on. It tests the Feed Roller Open Sensor and Feed Motor Open Motor, and ensures that the film feed rollers are open.
Feed Roller Open Motor
21-921
No
No
Is S11 blocked (off) ?
No
Run DCM4 in closing direction.
Is S11 on within 15 sec. ?
Yes
Is S11 off within 15 sec. ?
Feed Roller Open Sensor
Yes (Feed Rollers are open.)
Yes
Film Feed Motor
Turn on Step 1 for 1 second.
Film Feed Motor Check — — This routine starts about 36 seconds (+) after power-on. It allows the field engineer to observe operation of the Film Feed Motor Pump.
Vacuum Pump Motor
Turn on Vacuum Pump for 1 second.
Vacuum Pump Check — — This routine starts about 36 seconds (+) after power-on. It allows the field engineer to observe operation of the Vacuum Pump. (However, this is difficult to observe.)
From Rollback Tests
Sh. 3
Elevator Assembly Test — — This routine starts about 38 seconds after power-on. It exercises components of the Elevator Assembly and ensures that the elevator is down.
Is S12 blocked (off) ?
No
Elevator Home Sensor
Yes (Elevator is home.)
Elevator Motor
Run Step 8 to raise elevator.
Is S12 unblocked (on) within 15 sec.?
No
21-921
Yes
Continue raising elevator for 1 second.
So field engineer can observe.
Run Step 8 to lower elevator.
Is S12 blocked (off) within 15 sec.?
No
21-921
Yes
Continue lowering to bottom. Then stop Step 8.
Sh. 3
8100-227A

Figure 7-5. FILM FEEDER MODULE Diagnostics (Sheet 2)

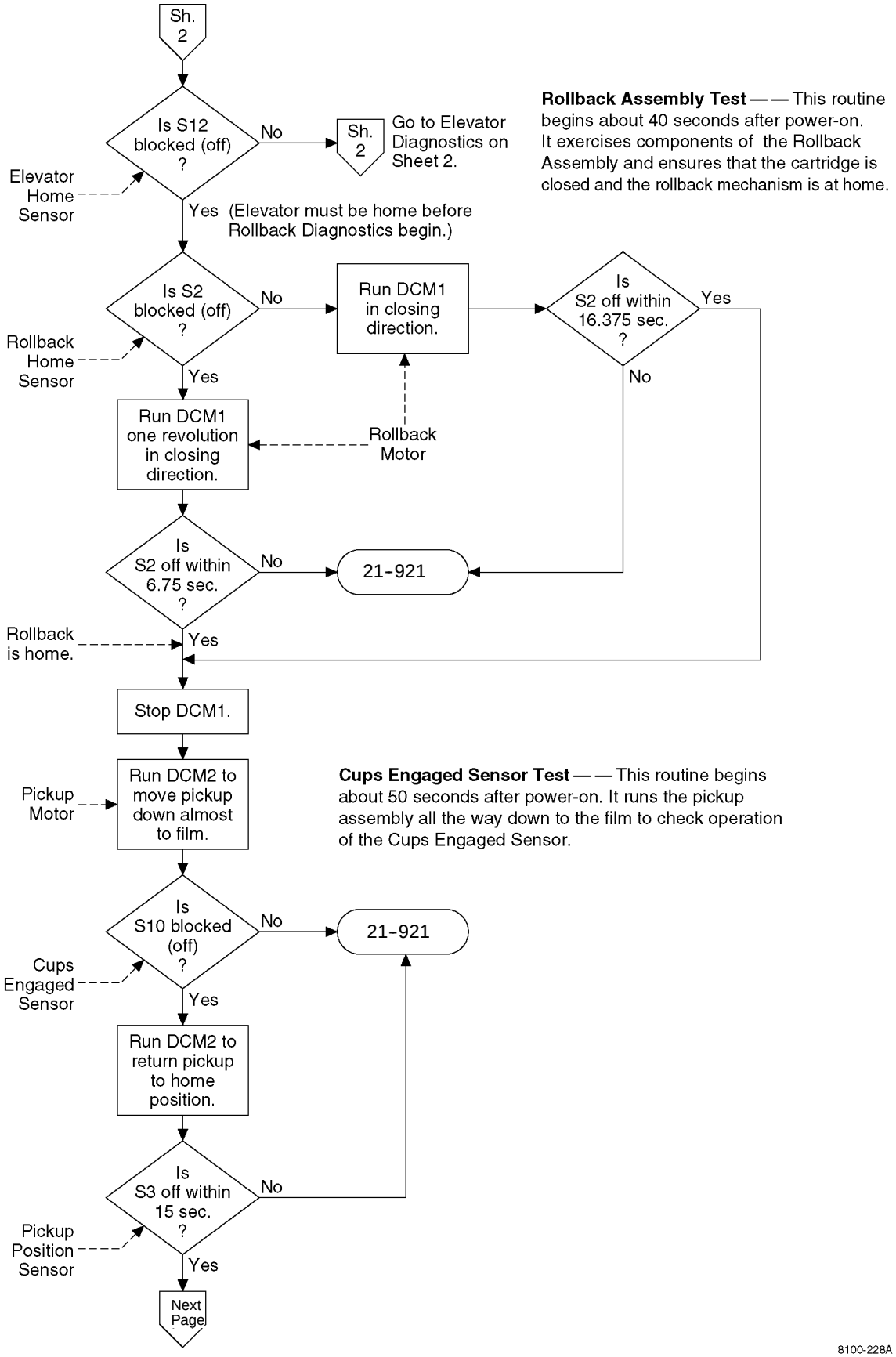
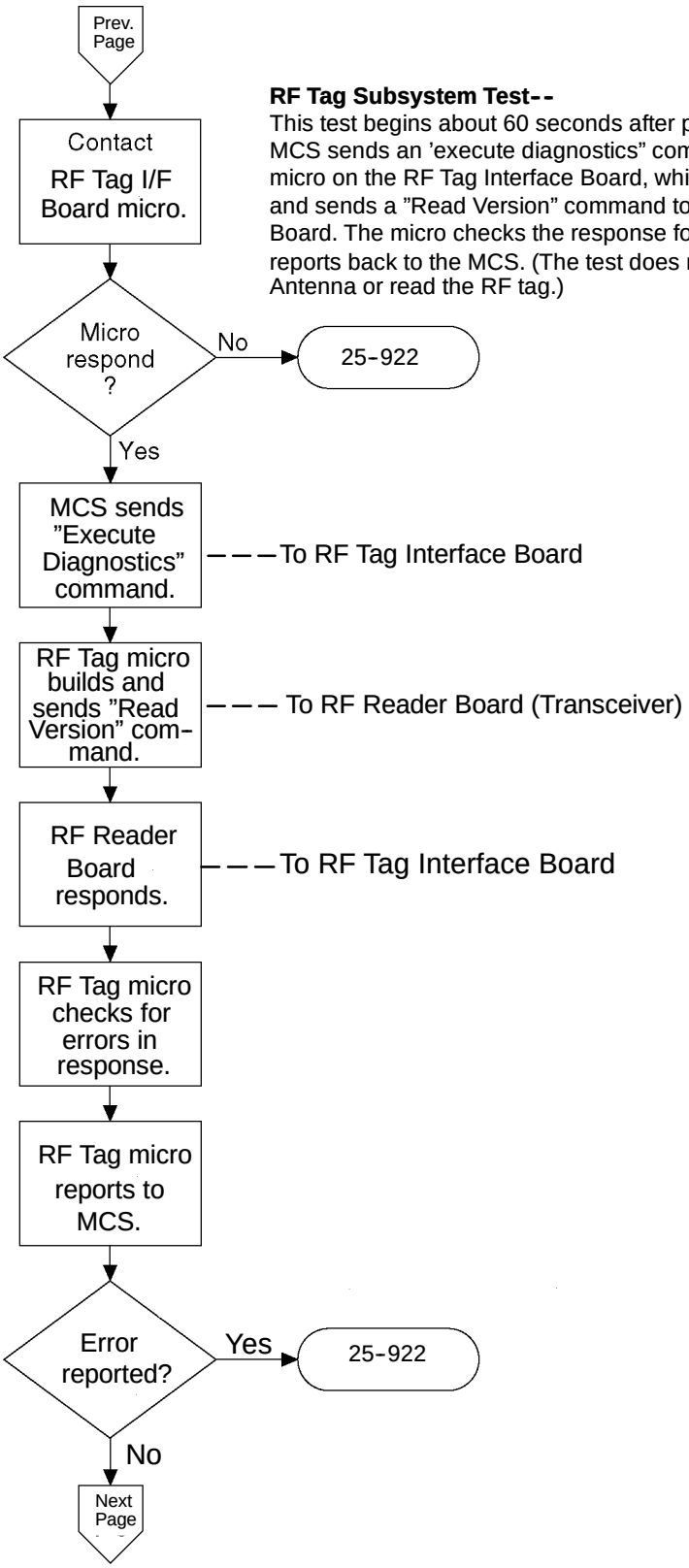
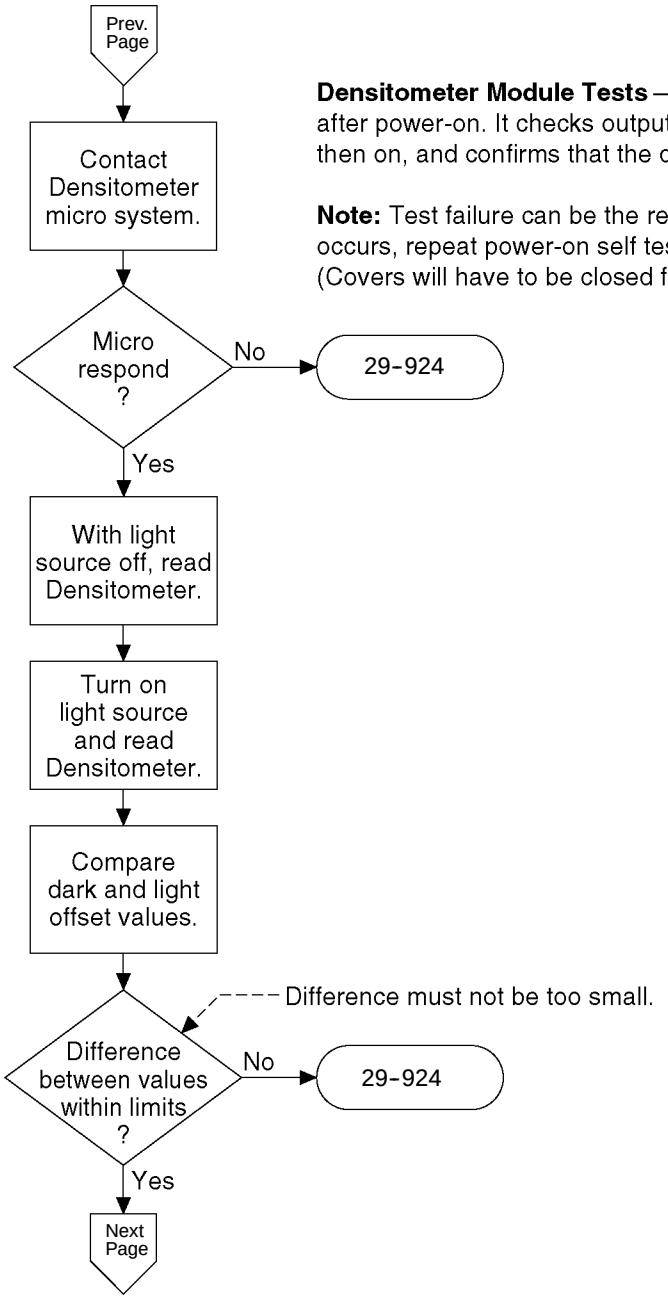

Sh. 2
Is S12 blocked (off) ?
No
Sh. 2
Go to Elevator Diagnostics on Sheet 2.
Elevator Home Sensor
Yes (Elevator must be home before Rollback Diagnostics begin.)
Rollback Assembly Test — — This routine begins about 40 seconds after power-on. It exercises components of the Rollback Assembly and ensures that the cartridge is closed and the rollback mechanism is at home.
Is S2 blocked (off) ?
No
Run DCM1 in closing direction.
Is S2 off within 16.375 sec. ?
Yes
Rollback Home Sensor
Yes
No
Run DCM1 one revolution in closing direction.
Rollback Motor
Is S2 off within 6.75 sec. ?
No
21-921
Rollback is home.
Yes
Stop DCM1.
Pickup Motor
Run DCM2 to move pickup down almost to film.
Cups Engaged Sensor Test — — This routine begins about 50 seconds after power-on. It runs the pickup assembly all the way down to the film to check operation of the Cups Engaged Sensor.
Is S10 blocked (off) ?
No
21-921
Cups Engaged Sensor
Yes
Run DCM2 to return pickup to home position.
Is S3 off within 15 sec. ?
No
Pickup Position Sensor
Yes
Next Page
8100-228A

Figure 7-5. FILM FEEDER MODULE Diagnostics (Sheet 3)



RF Tag Subsystem Test--
This test begins about 60 seconds after power–on. The MCS sends an 'execute diagnostics" command to the micro on the RF Tag Interface Board, which in turn builds and sends a "Read Version" command to the RF Reader Board. The micro checks the response for errors and reports back to the MCS. (The test does not check the RF Antenna or read the RF tag.)

Figure 7-6. RF Tag Subsystem Diagnostics

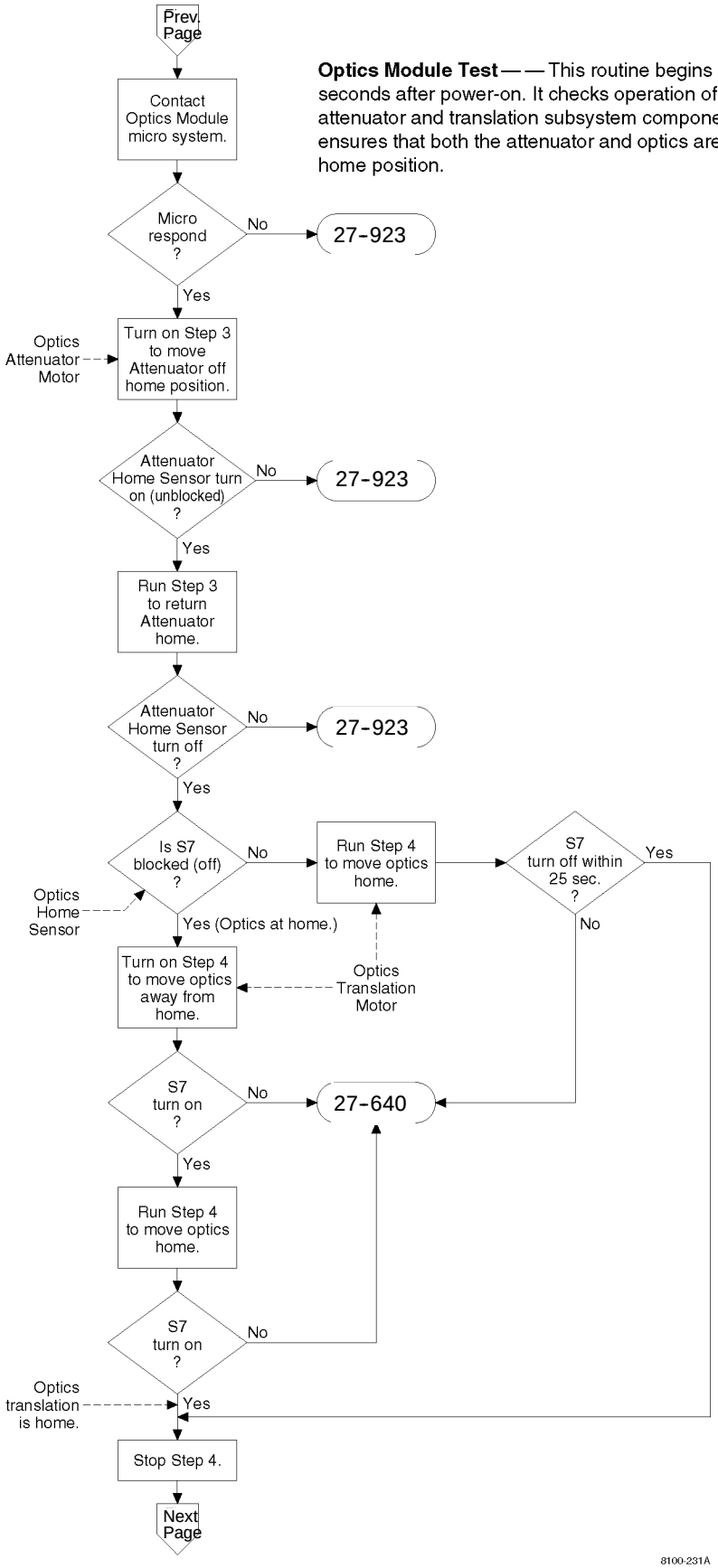


Densitometer Module Tests — — This routine begins about 63 seconds after power-on. It checks outputs of the Densitometer with the light source off, then on, and confirms that the difference in outputs is within established limits.

Note: Test failure can be the result of open imager door or rear panel. If an error occurs, repeat power-on self test with the door closed and the rear panel installed. (Covers will have to be closed for the last test in the self-test series anyway.)

8100-230A

Figure 7-7. DENSITOMETER MODULE Diagnostics



Optics Module Test — — This routine begins about 66 seconds after power-on. It checks operation of the optics attenuator and translation subsystem components and ensures that both the attenuator and optics are in the home position.

Figure 7-8. OPTICS MODULE Diagnostics

Optics (AIQC) Calibration and Diagnostics — — This procedure begins about 68 seconds after power-on. It performs full attenuator calibration and a laser power test and calibration. For this process to occur, the Service Override Switch must be in the normal position, and front door, top cover, and rear panel must be closed.

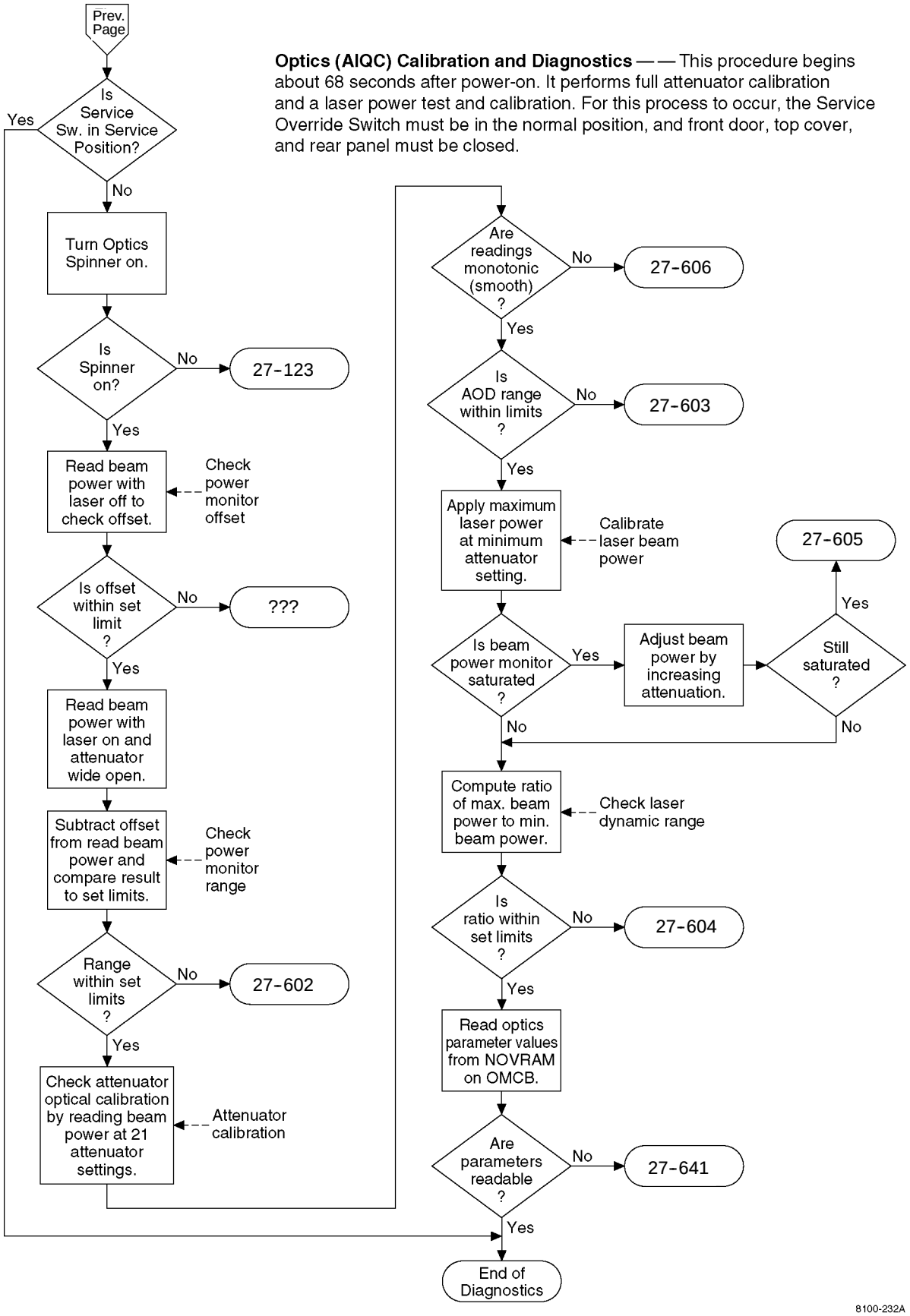


Figure 7-9. OPTICS (AIQC) Calibration and Testing

7-4. Functions of System SENSORS

The system includes 2 kinds of SENSORS (OPTICAL SWITCHES): flag-type and U-type. All the flag type SENSORS are identical except for CARTRIDGE PRESENT SENSOR S1 and PLATEN FILM SENSOR S6, and all the U-type SENSORS are identical except for OPTICS HOME SENSOR S7, as indicated in the table below. SENSOR functions are described in Table 7-3.

Table 7-3. SENSOR Functions

Ref Des	SENSOR Description	ASSEMBLY	Type	SENSOR Output*
S1**	CARTRIDGE PRESENCE	ROLLBACK	Flag	High (ON) when CARTRIDGE is loaded
S2	ROLLBACK HOME	ROLLBACK	U–type	Low (OFF) when CARTRIDGE LID is closed
S3	PICKUP POSITION	PICKUP	U–type	High (ON) with pickup assy in feed position. Low when pickup assy is at top.
S4	FILM SURFACE	PICKUP	Flag	High (ON) when flag contacts film
S5	FILM OUT	PICKUP	Flag	Low (OFF) when film is out
S6***	PLATEN FILM	IMAGING	Flag	High (ON) when film contacts flag
S7****	OPTICS HOME	PICKUP	U–type	Low (OFF) when SCANNER is home
S8	VERTICAL TRANSPORT	VERT. TRANSPORT.	Flag	High (ON) when flag contacts flag
S9	DENSITOMETER/ EXIT	DENSITOMETER	Flag	High (ON) when film contacts flag
S10	CUPS ENGAGED	PICKUP	U–type	Low (OFF) when cups are squashed
S11	FEED ROLLER OPEN	FEED ROLLER	U–type	Low (OFF) when ROLLERS are open
S12	ELEVATOR HOME	ELEVATOR	U–type	Low (OFF) when ELEVATOR is down/home
S13	ROLLBACK COMPLETE	ROLLBACK	U–type	Low (OFF) when CARTRIDGE LID is opened
	ATTENUATOR HOME	SCANNER		Not observable (in OPTICS MODULE)
	SHAFT INDEX	SCANNER		Not observable (in OPTICS MODULE)

* A blocked SENSOR = low = OFF (not conducting)

** CARTRIDGE PRESENCE SENSOR S1 is identical physically and electronically to the other flag type SENSORS, except it has a bidirectional ACTUATOR flag.

*** PLATEN FILM SENSOR S6 is identical physically and electronically to the other flag type SENSORS, except it has a longer ACTUATOR flag.

****OPTICS HOME SENSOR S7 is the only U-type SENSOR that is screw-mounted. Note in Figure 7-10 that S7 has a different pinout from the other SENSORS.

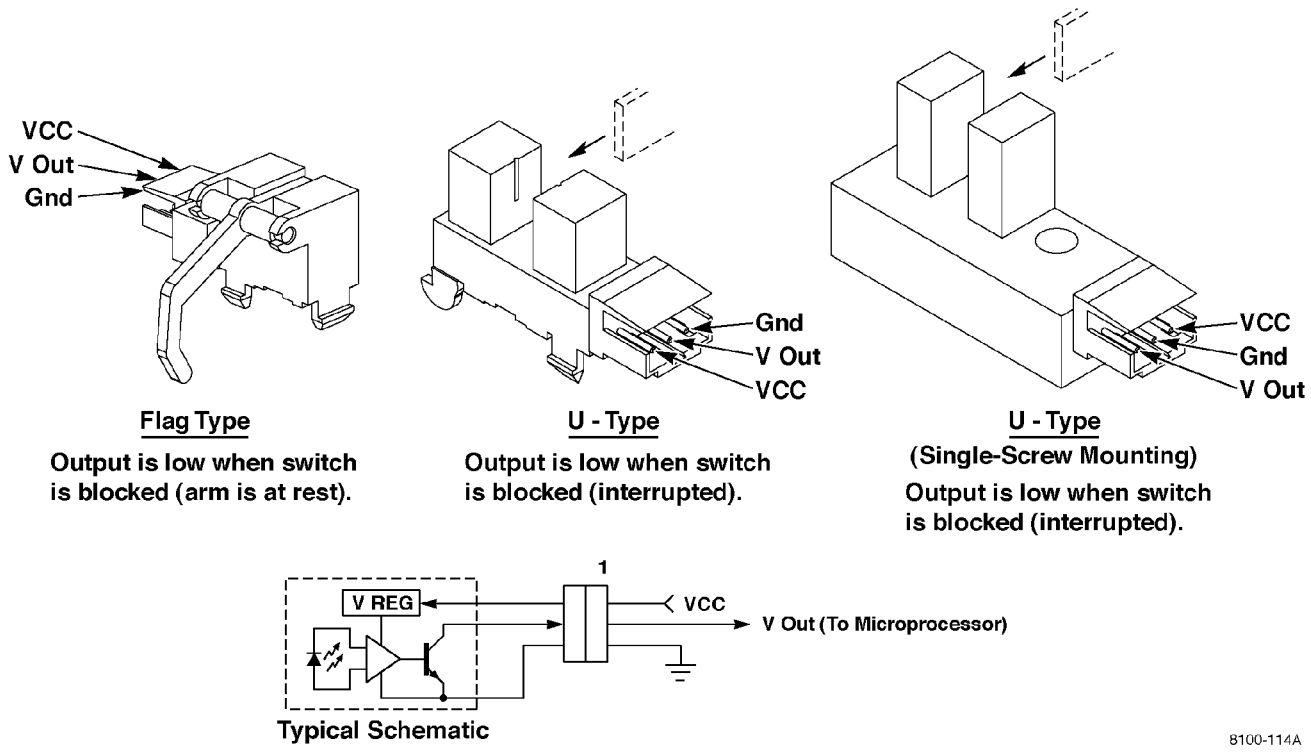


Figure 7-10. SENSOR Types

7-4-1. Testing the SENSORS Using LEDs

SENSORS S1-S13 are tied to LEDs which can be used in a test mode to monitor the operation of the SENSORS. The SENSORS report to MICROS on several different CIRCUIT BOARDS.

- SENSORS S1- S5 and S10-12 monitor film feed functions and report to the slave MICRO on the FEEDER CONTROL BOARD. The LEDs for these SENSORS are also on the FEEDER CONTROL BOARD. SENSOR locations in the IMAGER and locations of the corresponding LEDs are shown in Figure 7-11. (See paragraph 7-4-1-1 for testing procedure).
- SENSOR S13 (ROLLBACK OPEN) reports to the slave MICRO on the RF TAG INTERFACE BOARD. The LED for the SENSOR is located under the ROLLBACK TRAY, near the RF Tag electronics. (See paragraph 7-4-1-2.)
- SENSORS S6 (PLATEN FILM), S7 (OPTICS Home), and S8 (VERTICAL TRANSPORT) report to the master MICRO on the MCS BOARD. The LEDs for these SENSORS are located on the MCS BOARD. SENSOR locations in the 8100 LASER IMAGER and locations of the corresponding LEDs are shown in Figure 7-10. (See paragraph 7-4-1-3.)
- SENSOR S9 (DENSITOMETER/EXIT) reports to the slave MICRO on the DENSITOMETER BOARD. The LED for this SENSOR is on the LIGHT SOURCE BOARD in the DENSITOMETER MODULE. (See paragraph 7-4-1-3.)

Note

All SENSORS can also be checked via “Service WebLink”. See paragraph 7-2-8.

7-4-1-1. Testing Film Feed SENSORS S1-S5 and S10-S12 Via LEDs

Preliminary

1. Remove the FILM CARTRIDGE from the IMAGER and leave the FRONT DOOR open.
2. De-energize the IMAGER.
3. Remove the REAR PANEL.
4. Set the SERVICE OVERRIDE SWITCH in the Service position.
5. Set the JP2 JUMPER (LEDs) on the FEEDER CONTROL BOARD to short pins 1 and 2 (see Figure 7-11). This will enable the LEDs.
6. Set the JP3 JUMPER (SENSORS) to short pins 1 and 2. This will enable the SENSORS.
7. Energize the IMAGER and allow it to warm up.

Testing

1. Test the S1 (CARTRIDGE PRESENCE), S2 (ROLLBACK HOME), or S12 (ELEVATOR HOME) SENSOR as follows:
   a. Check the state of the SENSOR: LED1 (CARTRIDGE PRESENCE) should be *on*, LED2 (ROLLBACK HOME) *on*, and LED3 (ELEVATOR HOME) *off*.
   b. Load a CARTRIDGE of “transport” (waste) film. Set the SERVICE OVERRIDE SWITCH to the Normal position, then back to the Service position. Allow time for the CARTRIDGE to close.
   c. Check that the LED has changed state.
2. Test the PICKUP POSITION (S3), FILM SURFACE (S4), CUPS ENGAGED (S10), or FEED ROLLER OPEN (S11) SENSOR as follows:
   a. Check the current state of LED4 (for S3), LED5 (for S4), LED7 (for S10), or LED8 (for S11).
   b. Run a print sequence and check that the LED toggles during the sequence.
3. After completing the test, reset JUMPERS JP2 and JP3 in their normal positions (2-3).
4. Remove the transport FILM CARTRIDGE and restore the IMAGER to normal operating state (unless you are going to test SENSORS S6 through S9).

Note

To test FILM OUT SENSOR S5 via LED6, you will have to manually toggle the SENSOR.

7-4-1-2. Testing ROLLBACK COMPLETE SENSOR S13 with LEDs

1. Check that the IMAGER is in the **Preliminary** state (see paragraph 7-4-1-1), except ignore the settings of the JUMPERS. (FILM CARTRIDGE should be removed, FRONT DOOR open, and IMAGER energized.)
2. Reach in through the open FRONT DOOR and set the left DIP SWITCH on the RF TAG INTERFACE BOARD to *up.*
3. Check the LED on the RF TAG INTERFACE BOARD on the bottom of the CARTRIDGE TRAY. The LED should be off (SENSOR not blocked by ACTUATOR). Block the SENSOR. LED should turn on.
4. Set the left DIP SWITCH down.

Ref Des	SENSOR	Assy	Type	LED State on FEEDER CONTROL BOARD
S1	CARTRIDGE PRESENCE	ROLLBACK	Flag	LED1: On with no CARTRIDGE/ Off with CARTRIDGE loaded.
S2	ROLLBACK HOME	ROLLBACK	U-type	LED2: Off with lid open/ On with LID closed.
S3	PICKUP POSITION	PICKUP	U-type	LED4: Off in feed position/ On in top position.
S4	FILM SURFACE	PICKUP	Flag	LED5: Off when touching film/ On when not.
S5	FILM OUT	PICKUP	Flag	LED6: Off with film/ On with no film.
S10	CUPS ENGAGED	PICKUP	U-type	LED7: On when squashed/ Off when not.
S11	FEED ROLLER OPEN	FEED ROLLER	U-type	LED8: On when open/ Off when closed.
S12	ELEVATOR HOME	ELEVATOR	U-type	LED3: On when down/ Off when not.
S13	ROLLBACK OPEN	ROLLBACK	U-type	LED9: On when DIP SWITCH is up and CARTRIDGE LID is opened. (The SWITCH and LED are located on RF TAG INTERFACE BOARD.)

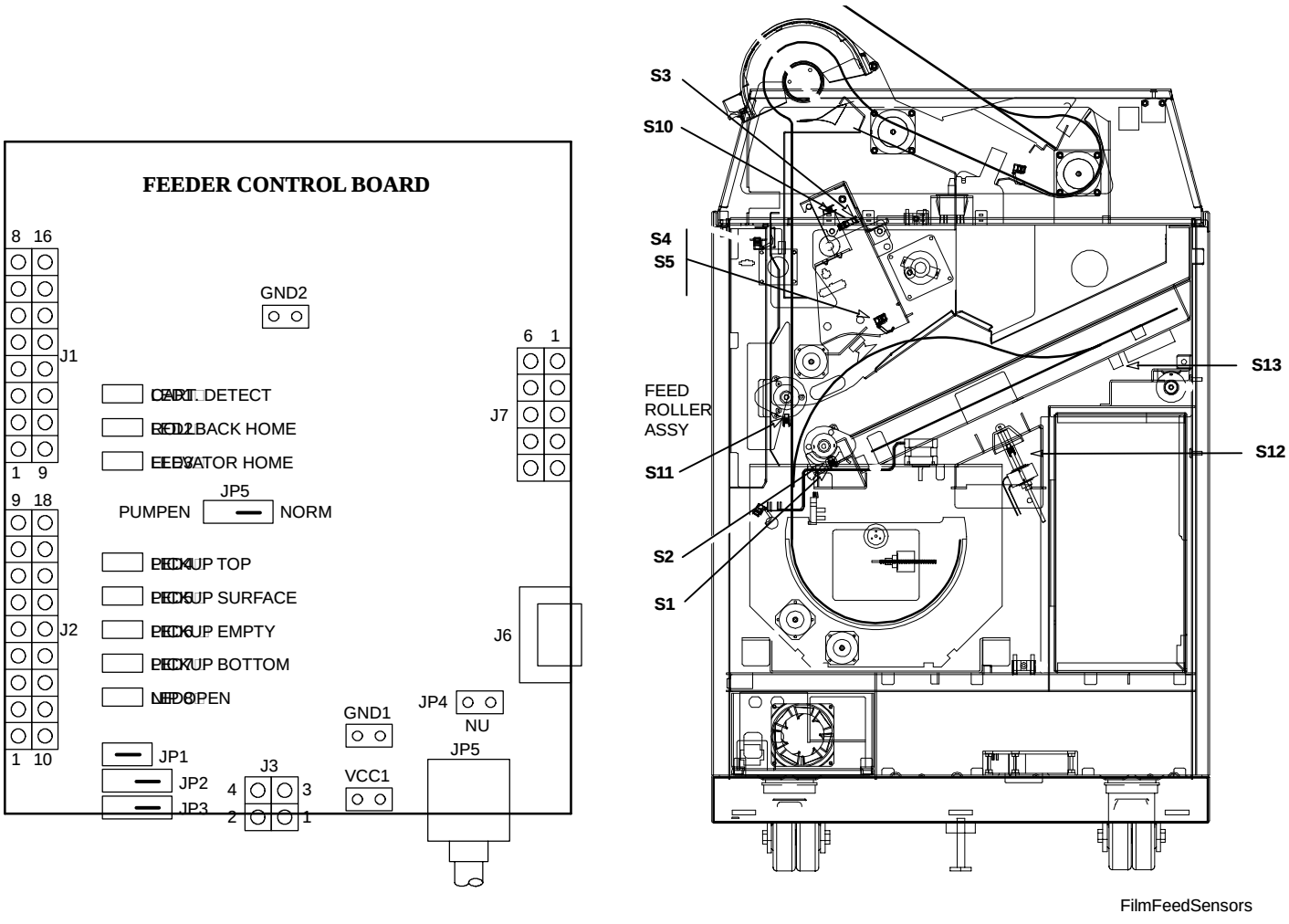


Figure 7-11. FILM FEED SENSORS and LEDs

7-4-1-3. Testing SENSORS S6-S9 Via LEDs

The LEDs for S6 through S8 are located on the MCS BOARD (see Figure 7-12). The LED for S9 is located on the DENSITOMETER LIGHT SOURCE BOARD. Use the LEDs to test these SENSORS as follows:

1. Check that the IMAGER is in the **Preliminary** state described in paragraph 7-4-1-1, except:
   a. Set the JP1 (LEDs) JUMPER on the MCS BOARD to short pins 1 and 2 (see Figure 7-12). This will enable the LEDs.
   b. Set the JP5 JUMPER (SENSORS) to short pins 1 and 2. This will enable the SENSORS.
2. Test the 4 SENSORS:
   a. Check the state of the LED for the SENSOR.
   b. Load a CARTRIDGE of transport (waste) film. Set the SERVICE OVERRIDE SWITCH to the Normal position, then back to the Service position. Allow time for the CARTRIDGE to close.
   c. Run a print sequence and check that the LED toggles.
3. After completing the test, reset the JUMPERS and remove the CARTRIDGE of transport film.

Ref Des	SENSOR Description	ASSEMBLY	Type	LED State on MCS BOARD
S6	PLATEN FILM	IMAGING	Flag	LED1: Off when film contacts flag.
S7	OPTICS HOME	IMAGING	U-type	LED2: On when SCANNER is home.
S8	VERTICAL TRANSPORT	VERT. TRANSPORT	Flag	LED4: Off when film contacts flag.
S9	DENSITOMETER/ EXIT	DENSITOMETER	Flag	LED2: Off when film contacts flag.

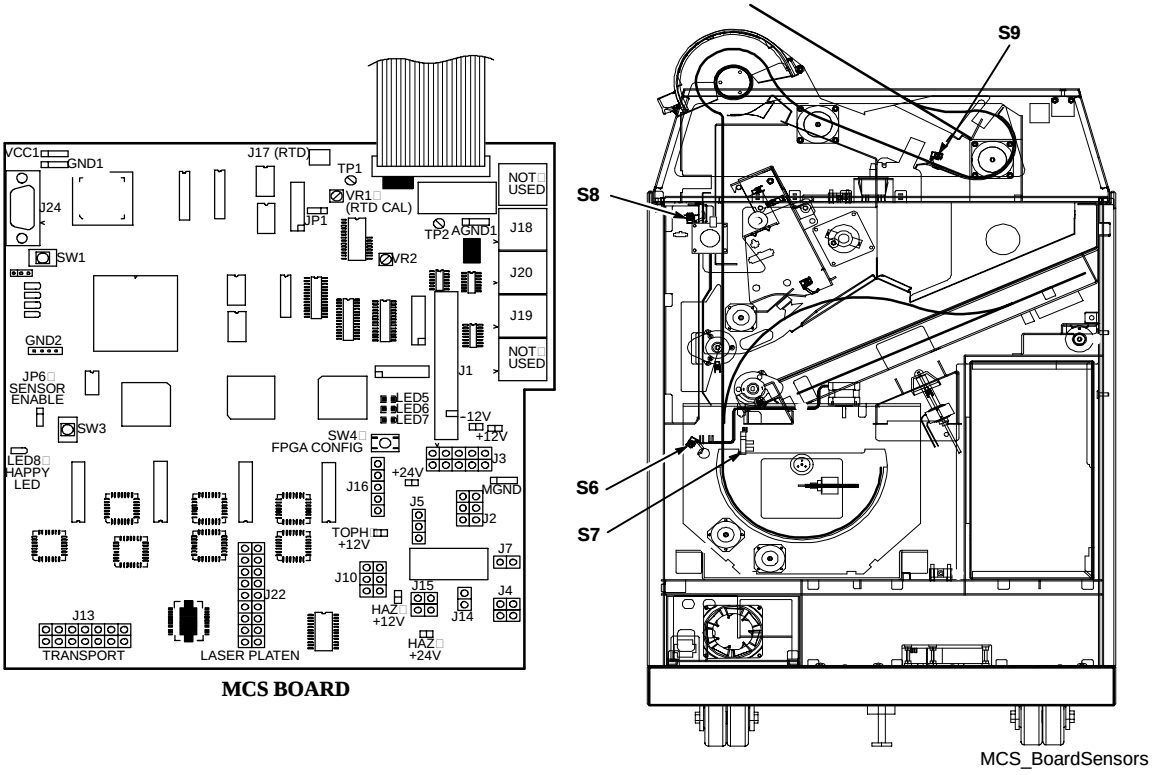


Figure 7-12. SENSORS S6 through S9 and LEDs

7-5. Troubleshooting Film Transport Problems

7-5-1. Troubleshooting Basics

The table below lists the error messages that can occur as a result of mechanical or SENSOR problems in the ASSEMBLIES that transport film through the IMAGER SYSTEM. Intermittent film jam problems are frequently misdiagnosed in the field. The error messages may indicate accurately the area in the IMAGER where the error code was generated, but the real cause of the problem can sometimes be located elsewhere in the IMAGER. For example, film skew that originates in the FILM PICKUP MODULE or the FEED ROLLER MODULE can result in a jam in the PLATEN MODULE, the VERTICAL TRANSPORT, or even the FILM PROCESSOR. Thus when you are analyzing a film transport problem, do not immediately assume that the ASSEMBLY where the jam occurred is the cause of the jam.

Table 7-4. Film Feed Errors

Error Message	Error Generated By	MACHINE Problem
21-116 Pickup Failure – Area 1	Mechanical or SENSOR failure in FILM PICKUP or ROLLBACK MODULE.	Defective FILM PICKUP MODULE or ROLLBACK MODULE.
21-119 Feed Err Area 2	Film did not reach FILM PLATEN SENSOR S6.	Defective FILM PICKUP MODULE, FEED ROLLER MODULE, or SENSOR S6.
26-164 Jam – Area 3	Film jammed at entrance to PLATEN.	Film skew, PLATEN DRIVE ROLLER BEARING BLOCKS not installed correctly, PLATEN FILM CENTERING PIN out of position, faulty SENSOR S6.
26-165 Jam – Area 3	Film jammed between PLATEN and film PROCESSOR in VERTICAL TRANSPORT.	Film skew, faulty SENSOR S6 or VERTICAL TRANSPORT SENSOR S8.
26-169 Jam – Area 3	Film jammed exiting PLATEN.	Film skew, faulty SENSOR S6.
21-176 Crtg Open Err	IMAGER could not open CARTRIDGE.	Defective ROLLBACK MODULE.
21-177 Crtg Close Err	IMAGER could not close CARTRIDGE.	Defective ROLLBACK MODULE.
26-542 Jam – Area 4	Film jammed on PROCESSOR DRUM.	Film skew or faulty VERTICAL TRANSPORT SENSOR S8.
26-543 Jam – Area 5	Film jammed between PROCESSOR DRUM and DENSITOMETER.	Film skew, faulty DENSITOMETER/EXIT SENSOR S9.
26-544 Jam – Area 5	Film jammed between DENSITOMETER and EXIT TRAY.	Film skew, faulty DENSITOMETER/EXIT SENSOR S9.

7-5-2. Troubleshooting Sequence

At a service call involving film jam problems, it is recommended that you perform the following trouble analysis procedures in order. It is not necessary to perform every procedure on each service call. Simply proceed until you find and correct the IMAGER problem.

1. Question the operator about IMAGER problems. (See paragraph 7-5-3.)
2. Visually inspect the components of the FILM TRANSPORT. (See paragraph 7-5-4.)
3. Set the IMAGER in transport cycle mode and observe the IMAGER for problems as film is transported through the system. (See paragraph 7-5-5.)
4. As indicated by the checks performed in 2 and 3 above, remove suspect MODULES from the IMAGER and perform detailed checks and repair. (See paragraph 7-5-6.)
5. After correcting the problem, set the IMAGER in transport cycle mode again, and confirm transport operation. (See paragraph 7-5-7.)

7-5-3. Interviewing the Operator

Question the operator, if possible, about:

1. Frequency of particular error codes or jams.
2. Any recent unusual sounds from MACHINE (for example, bangs, etc., that could indicate PICKUP MOTOR PINION damage).
3. Did the operator have to frequently close or open the FILM CARTRIDGE manually via the ROLLBACK KNOB?

7-5-4. Preliminary Visual Inspection

7-5-4-1. Preparation

1. Remove the customer’s FILM CARTRIDGE from the IMAGER and load a CARTRIDGE of transport film.
2. Open the FRONT DOOR, de-energize the IMAGER, and remove the REAR PANEL.
3. Manually turn the ROLLBACK KNOB clockwise to roll back the foil on the CARTRIDGE COVER.

7-5-4-2. Checking the ROLLBACK MODULE for Problems

❑ 1. Inspect the FILM GUARD (see Figure 7-13). Is the entire top surface flat, or has the CAM ARM been bent upward?

❑ 2. Inspect the SEPARATOR TABS. Are they bent down?

❑ 3. Manually turn the ROLLBACK ROLLER toward the SEPARATOR TABS until they begin to lift (see Figure 7-14). Check the clearance between the ROLLBACK ROLLER and the SEPARATOR TABS. It must be at least 5 to 10 mm.

❑ 4. If your inspection reveals problems, advance to paragraph 7-5-6-1 to **Remove and Inspect the ROLLBACK MODULE**.

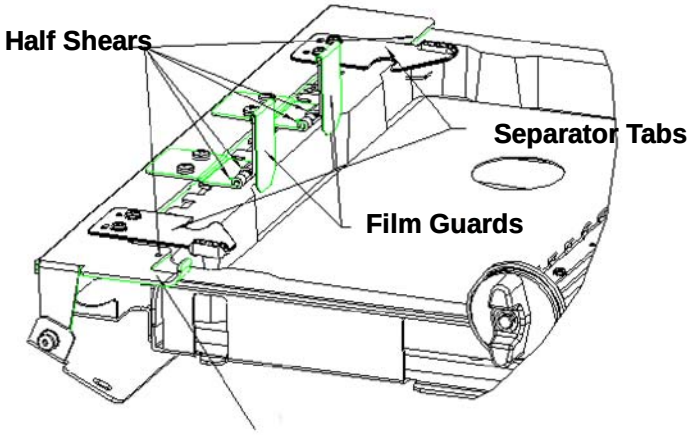


Figure 7-13. ROLLBACK MODULE COMPONENTS

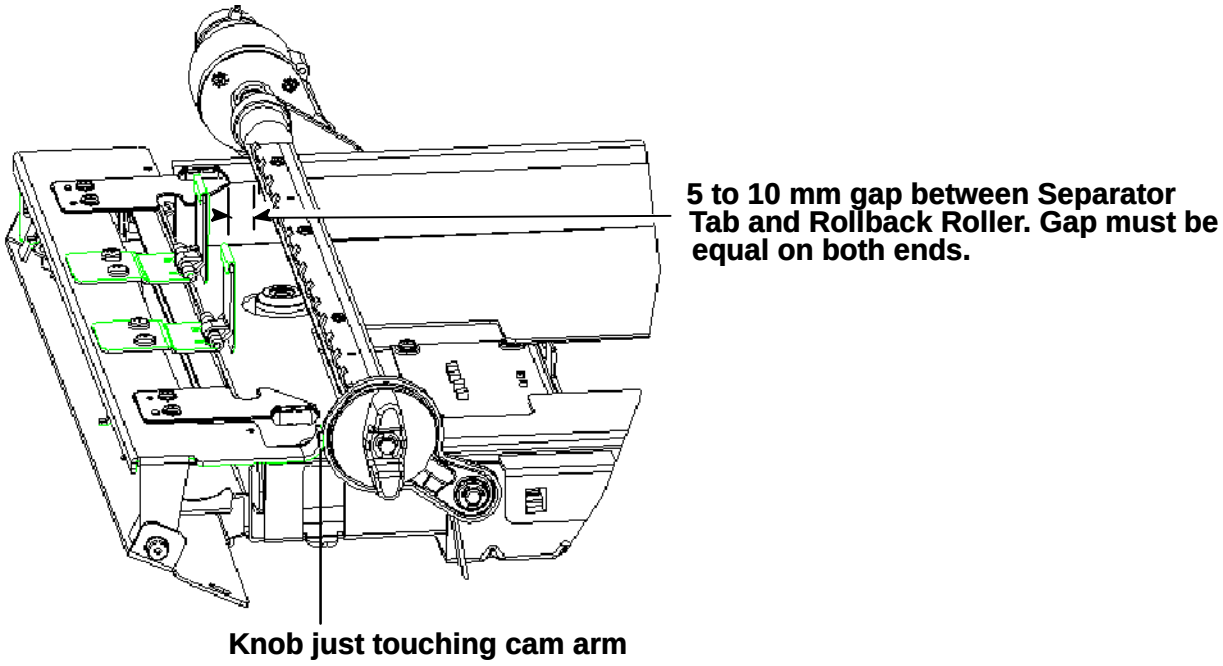


Figure 7-14. Spacing between SEPARATOR TABS and ROLLBACK ROLLER

7-5-4-3. Checking the FILM PICKUP MODULE for Problems

❑ 1. Check that all SUCTION CUPS are spring-loaded and slide back and forth freely in their slots.

❑ 2. Check that the SUCTION CUPS are finger tight.

❑ 3. Check the HEEL PAD for adhesion to the HEEL.

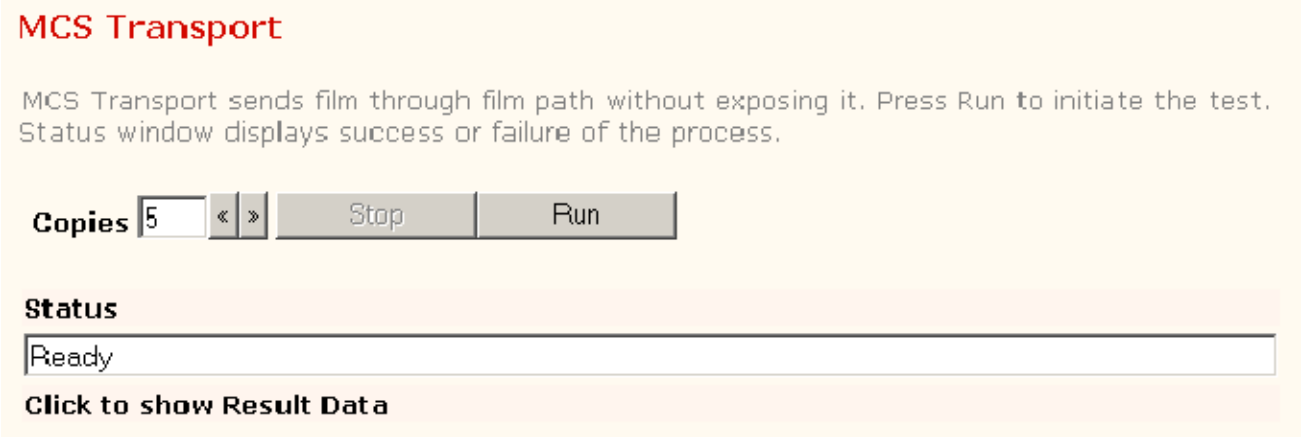
❑ 4. If your inspection reveals problems, advance to paragraph 7-5-6-2 to remove and inspect the FILM PICKUP MODULE.

7-5-5. Cycling Film and Observing the Film Transport Process

7-5-5-1. Preliminary Setup

1. Connect your LAPTOP COMPUTER to the IMAGER (see procedure 7-2-3).
2. Set the SERVICE SWITCH in the Service position and power up the SYSTEM.
3. Use “SecureLink” to connect to the IMAGER.
4. Launch “Service WebLink”.
5. When instructed to in the following procedures, start film cycling as follows:

   a. Select **Diagnostics>Test Prints>MCS Transport**.



   b. Set the “Copies” window at 5.

   c. Click [Run] to cycle film.

7-5-5-2. Checking the ROLLBACK MODULE

Start film cycling (see paragraph 7-5-5-1 above).

❑ 1. Does the ROLLBACK open far enough to allow room for film pickup?

❑ 2. Does the film slip off the SEPARATOR TABS at maximum bend position?

Note

"Maximum bend" is the CUP and film position during the 3-second pause. Slippage from the tabs will cause double feeds. The problem could be bent SEPARATOR TABS (see paragraph 7-5-6-1[3]).

❑ 3. If these or other problems are apparent, go to paragraph 7-5-6-1, to remove and inspect the ROLLBACK MODULE.

7-5-5-3. Checking the FILM PICKUP MODULE

Start film cycling (see paragraph 7-5-5-1 above).

❑ 1 Does the DRIVER ARM hesitate as it moves up and down (except for the 3 second pause after pickup)? If it does, the PICKUP MOTOR PINION might be partially sheared.
See paragraph 7-5-6-2 (3).

❑ 2. Can you hear the VACUUM MOTOR turn on and off during the cycle? It should turn on when the cups squash down on the film, and turn off when the film is at feed position.
If the MOTOR does not turn on and off at the right time, feed problems will occur. If it remains on constantly, feed problems and film quality problems will also occur, and the MOTOR will fail prematurely.

❑ 3. Does the HEEL stay down on the film while the ASSEMBLY is at the 3 second maximum bend position? If it does not, there is an alignment problem between the CUPS ENGAGED SENSOR on the HEEL ASSEMBLY and the corresponding ACTUATOR flag on the DRIVER ASSEMBLY. Replace the FILM PICKUP MODULE.

❑ 4. Does the leading edge of the film hit the FEED ROLLER as film is lifted to feed position? This can be caused by failure of the CUP PLATE to pivot freely relative to the HEEL.
See paragraph 7-5-6-2 (2).

❑ 5. Check the position of the film when it is inside the FEED ROLLERS after they are closed. It should extend 2 to 4 mm over the small diameter DRIVE ROLLER, and skew from end to end should be less than 1 mm. If the film is skewed, check alignment of components in the PICKUP MODULE.
See paragraph 7-5-6-2 (4).

❑ 6. After the film is initially clamped by the FEED ROLLERS, is it pulled back by the PICKUP ASSEMBLY when the PICKUP homes itself? There should be less than 1 mm of film pullback.
If pullback is excessive, pickup vacuum is being released too late. See paragraph 7-5-6-2 (4).

❑ 7. If any of the above problems is noted, advance to paragraph 7-5-6-2 to remove and inspect the FILM PICKUP MODULE.

7-5-5-4. Checking the FEED ROLLER MODULE

Start film cycling (see paragraph 7-5-5-1 above).

❑ 1. When the IDLER ROLLER clamps down on the FEED ROLLER, is 1 side of the ROLLERS clamped while there is a noticeable gap on the other side? If the ROLLERS are not aligned with one another, film skew will result. See paragraph 7-5-6-3(3).

❑ 2. Observe the POST PICKUP FILM GUIDE as the film feeds toward the PLATEN. The film should not track to either side more than 1 to 2 mm. If it does, PLATEN centering may not work properly. The film could enter the PLATEN outside of the working range of the film CENTERING PIN.

❑ 3. If either of the above problems is apparent, advance to paragraph 7-5-6-3 to remove and inspect the FEED ROLLER MODULE.

7-5-5-5. Checking the PLATEN MODULE

Start film cycling (see paragraph 7-5-5-1 above).

❑ 1. Does film occasionally hang up at the entrance to the PLATEN just beneath the DRIVE ROLLERS. If it does, the PLATEN DRIVE ROLLER BEARING BLOCKS may not be installed correctly or the PLATEN support tabs may be out of spec. See paragraph 7-5-6-4.

❑ 2. Does film hit the end of the PLATEN FILM SENSOR upon entry*?* No part of the radiused end of the SENSOR flag should extend out of the curved INNER GUIDE.

❑ 4. Is the film pushed at least 1 mm by the film CENTERING PIN? See Note in paragraph 7-5-6-4.

❑ 5. If any of the above problems is apparent, advance to paragraph 7-5-6-4 to remove and inspect the PLATEN MODULE.

7-5-6. Remove and Inspect Suspect MODULES

7-5-6-1. Removing and Inspecting the ROLLBACK MODULE

1. Remove the ASSEMBLY as instructed in procedure 4-7-1.
2. Inspect the FILM GUARD. Is the entire top surface flat, or has the CAM ARM been bent upward (as a result of manually closing the FILM CARTRIDGE with a jam in Area 2. If the FILM GUARD is bent, replace it.
3. Inspect the SEPARATOR TABS. Are they bent down (as the result of the ROLLBACK ROLLER rolling over the tops of the TABS)? If they are bent down, replace them.
4. Check that the FILM GUARD pivots freely, with no noticeable friction from the TRAY. If it does not, replace it.
5. Check that the CARTRIDGE PRESENT SENSOR, the ROLLBACK HOME SENSOR, and the ROLLBACK OPEN SENSOR are securely seated with their snap feet extending through the cutouts. If snap feet are broken, replace the SENSOR.

7-5-6-2. Removing and Inspecting the FILM PICKUP MODULE

1. Remove the MODULE as instructed in procedure 4–6-1. (See Figure 7-15 below for identification of components referenced in the following procedures.)

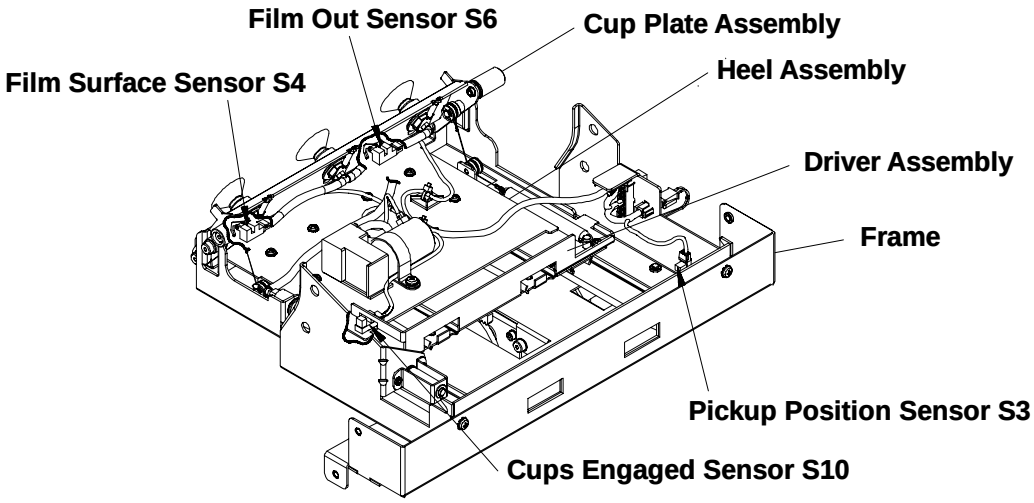


Figure 7-15. FILM PICKUP MODULE COMPONENTS

2. Check the CUP PLATE ASSEMBLY as follows (see Figure 7-16):

   ❑ a. Do the CUPS slide back and forth freely in their slots? If not, check alignment of the VACUUM HOSES attached to the cups. If they are impeding movement of the CUPS, reposition the hoses.

   ❑ b. Are the CUPS finger tight? It not, tighten them.

   ❑ c. Are the CUP SPRINGS overextended? If so, replace them.

   ❑ d. Does the CUP PLATE ASSEMBLY rotate freely on its pivots. If not, check and bend the pivot flanges, as necessary, to align them.

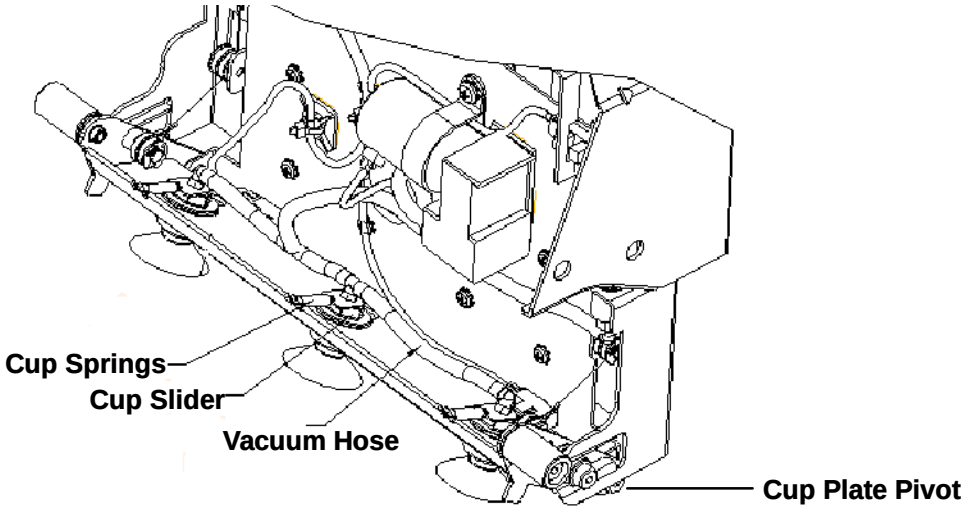


Figure 7-16. Components of the CUP PLATE ASSEMBLY

3. Check the PICKUP MOTOR DRIVE PINION as follows (see Figure 7-17):

   ❑ Grasp the plastic PINION and attempt to rotate it back and forth relative to its HUB. If there is any play, the PINION is sheared and the MOTOR ASSEMBLY must be replaced.

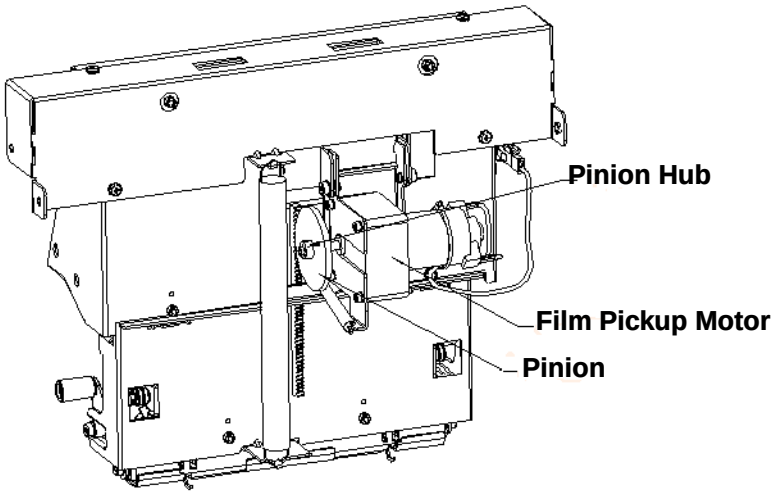


Figure 7-17. Components of the FILM PICKUP MOTOR

4. Check the DRIVER ASSEMBLY as follows (see Figure 7-18):

Note

To allow moving the DRIVER ASSEMBLY back and forth in the following checks, disengage the plastic PINION of the PICKUP MOTOR from the rack, and wedge something between the MOTOR FRAME and PICKUP ASSEMBLY FRAME to keep the rack and PINION disengaged.

❑ a. Slide the driver ASSEMBLY and the HEEL ASSEMBLY all the way up to the top of the FRAME. Check that the HEEL and DRIVER are parallel to each other and to the FRAME. If they are not, film will be skewed in the pickup process. The assemblies must be realigned on their SLIDES or the PICKUP MODULE must be replaced.

❑ b Slide the DRIVER ASSEMBLY all the way down in the opposite direction so it is fully extended. Rock the DRIVER back and forth to check for play in the SLIDES. If there is excessive play, replace the PICKUP MODULE.

❑ c. Slide the DRIVER ASSEMBLY back up toward the top of the FRAME until the edge of the metal frame tab ACTUATOR is exactly half way (lined up with the SENSOR notch) into the PICKUP POSITION SENSOR (see Figure 7-19). Use a FEELER GAUGE to check the gap between the stem of the VACUUM RELEASE VALVE and the spring-loaded PLUNGER. The gap should be 0.030 to 0.070 inch (1.3 to 1.8 mm). If the gap is too large, vacuum will be released too late, and the film will pull back from the FEED ROLLERS, resulting in a skewed feed. If the gap is too small, vacuum release will be premature, and the film will drop before the FEED ROLLERS clamp. If the gap is out of spec, the PICKUP MODULE must be replaced.

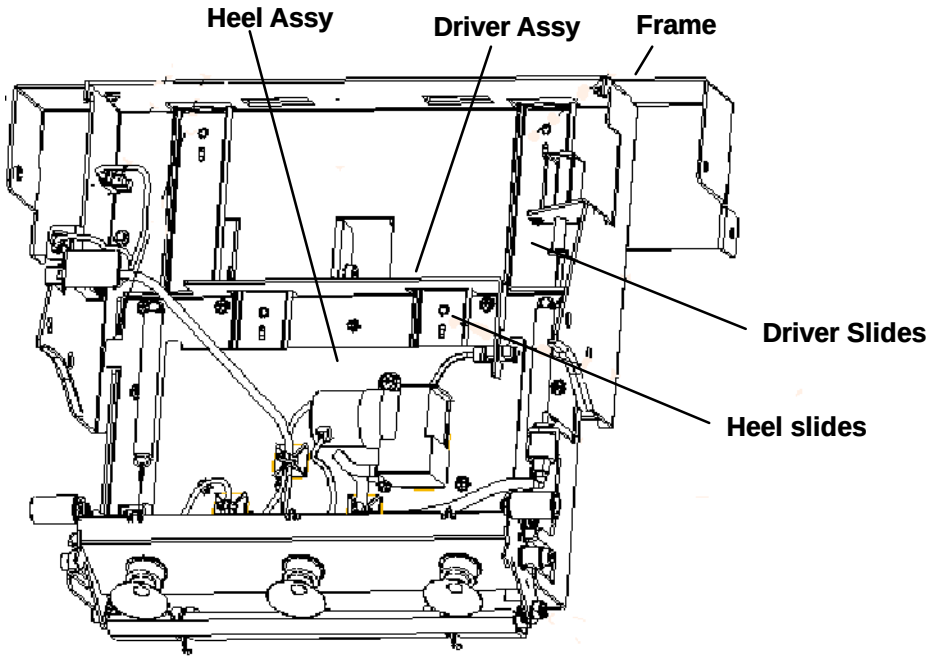


Figure 7-18. DRIVER and HEEL ASSEMBLIES

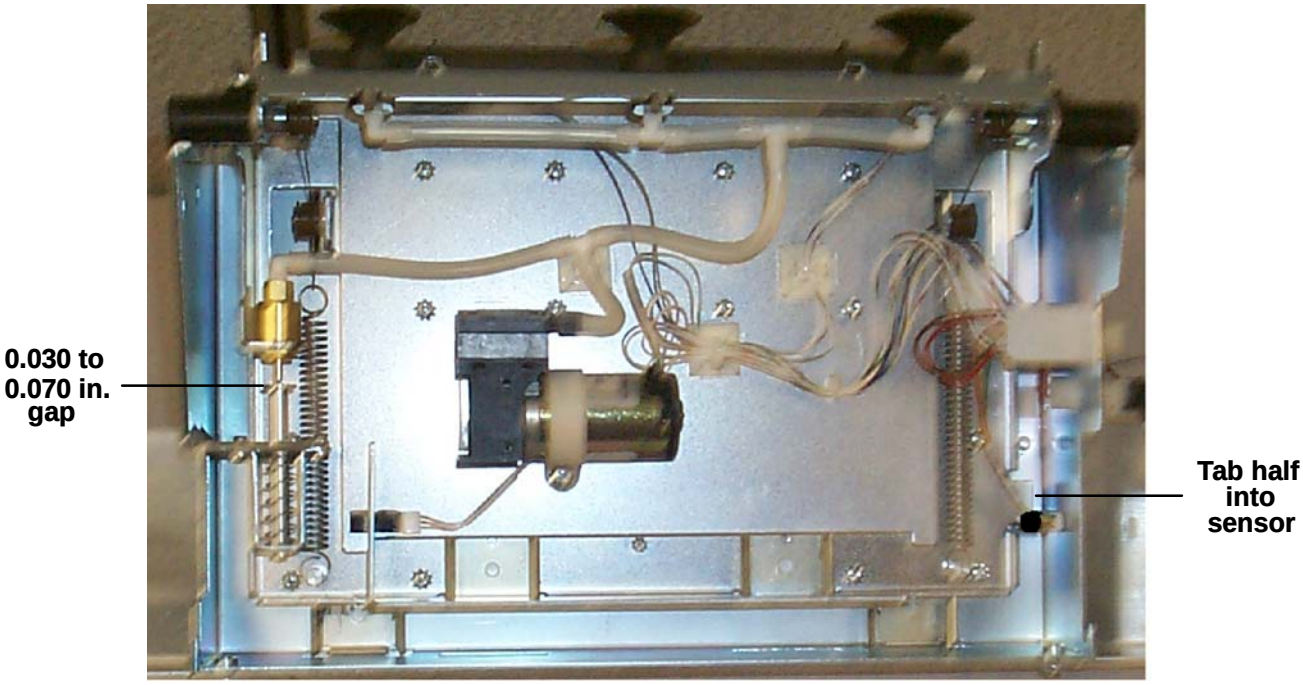


Figure 7-19. VACUUM RELEASE VALVE Gap

5. Check that the HEEL PAD is securely attached to the HEEL ASSEMBLY from end to end and side to side. If it is not, replace the PAD. (See paragraph 4-6-3.)

Note

Alignment of the HEEL ASSEMBLY with respect to the DRIVER ASSEMBLY and the FRAME is checked in paragraph 7-5-6-2(4).

6. Check that all 4 SENSORS in the FILM PICKUP MODULE are securely mounted, with their snap legs protruding through the metal mounting BASE.
7. Check that the large CUP PLATE SPRINGS are mounted properly in the grooves of the PINS on the driver BASE. Also check that the 2 CABLES are in the grooves of the PULLEY.

7-5-6-3. Removing and Inspecting the FEED ROLLER MODULE

1. Remove the MODULE as instructed in procedure 4-9-1.
2. Use a 9-volt dry cell BATTERY to close the IDLER ROLLER on the DRIVE ROLLER as follows:
   - Insert a paper clip in each of the 2 pin sockets of the CONNECTOR for the FEED ROLLER OPEN MOTOR.
   - Place the BATTERY poles across the 2 paper clips to drive the IDLER ROLLER up against the FEED ROLLER.
3. Check the components of the FEED ROLLER MODULE as follows (see Figure 7-20):

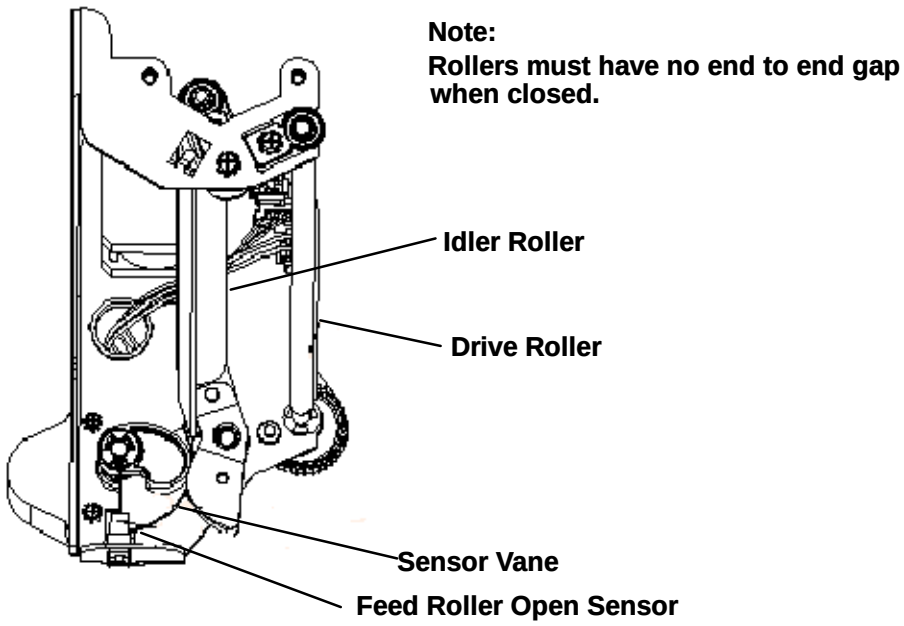


Figure 7-20. FEED ROLLER MODULE

❑ a. Are the 2 ROLLERS tight on both ends? (Film skewing will occur unless the ROLLERS are parallel and even, with no gap from end to end.) If the ROLLERS are open on 1 end, you can attempt to twist the FEED ROLLER MODULE frame to close the gap. If you cannot close the gap, you must replace the MODULE.

❑ b. Is the FEED ROLLER OPEN SENSOR securely mounted, with the snap legs protruding through the metal mounting BASE? If the snap legs are broken, replace the SENSOR.

❑ c. Use the 9-volt BATTERY to open the ROLLERS. Does the SENSOR vane strike the sides of the FEED ROLLER OPEN SENSOR?

❑ d. Examine the torsion SPRINGS at the pivots for the IDLER ROLLER. Are the ends of the SPRINGS seated properly?

7-5-6-4. Removing and Inspecting the FILM PLATEN MODULE

1. Remove the MODULE as instructed in procedure 4-11-1 in this manual.
2. The primary cause of jams as the film enters the PLATEN is: The PLATEN ROLLER BEARING BLOCKS are mispositioned so at entry the film strikes the support TABS just under the ROLLERS (see Figure 7-21). Check as follows:

   Are the 2 BEARING BLOCKS pushed all the way forward against the imaging cylinder (see Figure 7-22) If not, the bearing block SCREWS (2 each) must be loosened and the BLOCKS must be repositioned. Reference procedure 4-11-9.)

Note

If jams at the PLATEN SUPPORT TABS occur even when the BEARING BLOCKS are correctly installed, the PLATEN FRAME is probably out of spec, and the PLATEN ASSEMBLY must be replaced.

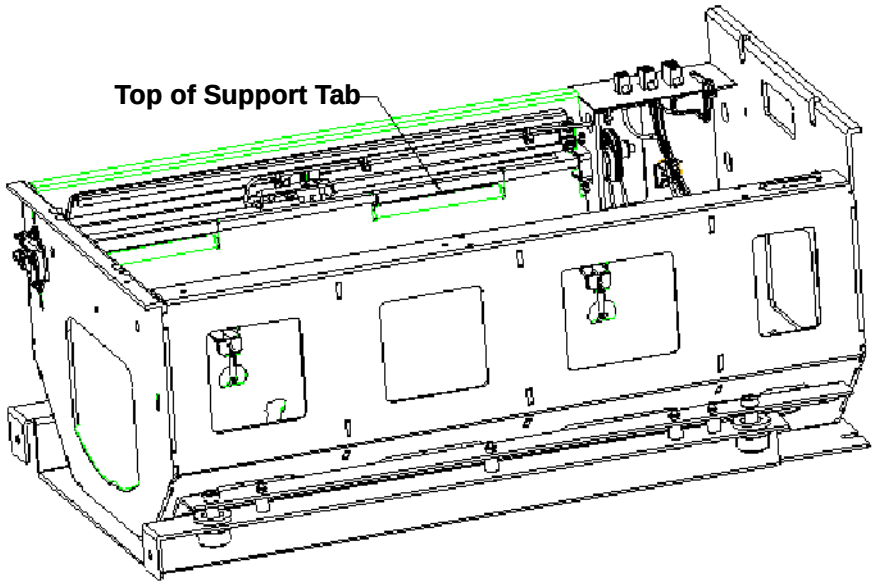


Figure 7-21. Support Tab at Entry to PLATEN ASSEMBLY

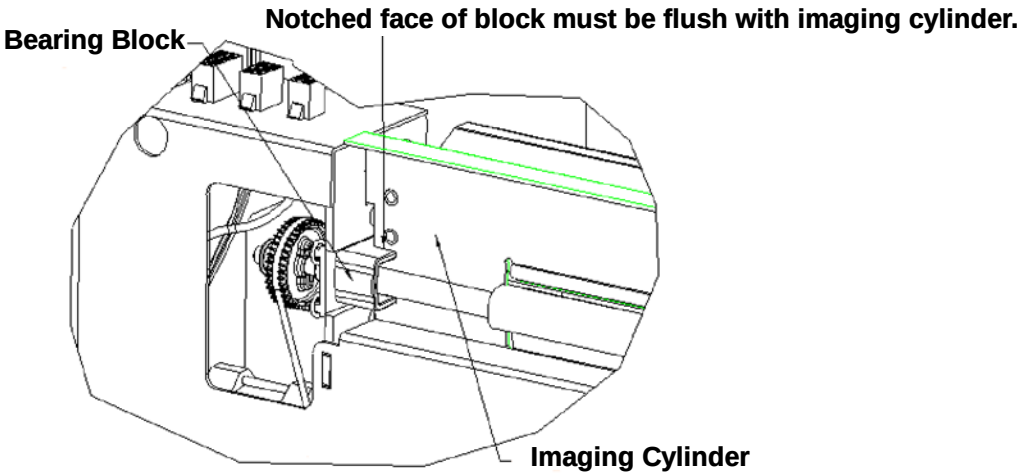


Figure 7-22. Bearing Block Position

7-5-7. Replace the Repaired MODULE and Cycle Film to Confirm Repair

After repairing the suspect MODULE(s), cycle film as instructed in paragraph 7-5-5-1 and observe transport operation to confirm that the problem has been resolved.

7-6. Troubleshooting the Sources of Film Scratches

This procedure provides a logical sequence for locating the causes of film scratches in the MACHINE, starting from the DENSITOMETER TURNAROUND (Area 5) and working down to the PLATEN (Area 3). The areas where film scratches can most likely occur are:

- DENSITOMETER/TURNAROUND
- PROCESSOR FELT PAD
- PROCESSOR FILM DIVERTER (STRIPPER)
- PLATEN ASSEMBLY

7-6-1. Preparation for Transporting Film in the Service Mode

1. Set the SERVICE SWITCH in Service Mode.
2. Open the UPPER HOOD and the PROCESSOR DRUM COVER.

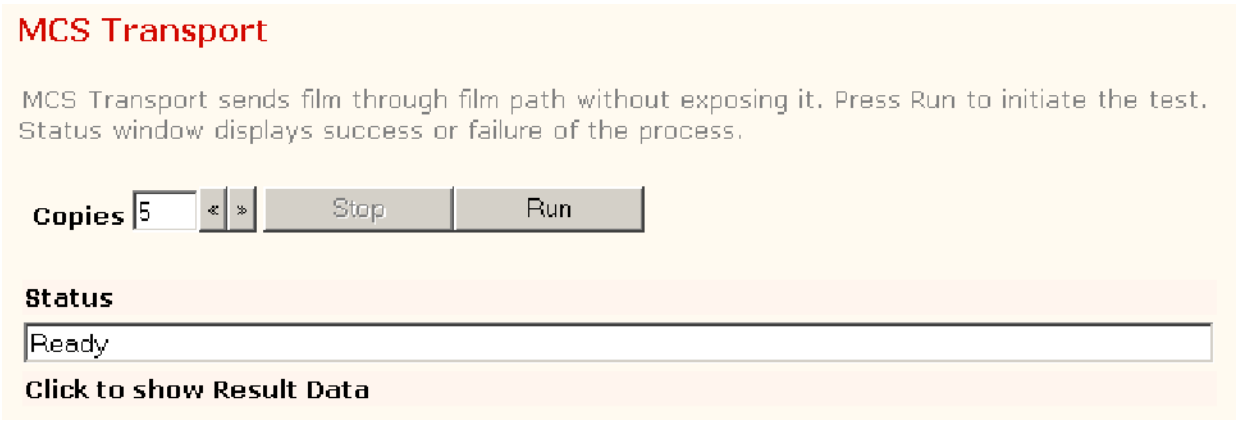
Note

Be familiar with the following operations for controlling FILM CARTRIDGE functions in the Service mode.

- To close the FILM CARTRIDGE and open the FRONT DOOR, use the LOCAL PANEL **Open Door** key. (The LOCAL PANEL will indicate 20-208, Open Door Fail, because the FRONT DOOR still appears closed to the MCS in Service mode.)
- To lower the ELEVATOR and open the FILM CARTRIDGE, set the SERVICE SWITCH to the Normal position. The MCS will see the FRONT DOOR as being open. Then set the SERVICE SWITCH back to the Service position. The MCS will see the FRONT DOOR as being closed, and will lower the ELEVATOR and close the CARTRIDGE. The IMAGER can now transport film.

7-6-2. Isolating the General Area where Scratches are Occurring

1. Remove the 4 ATTACHING SCREWS for the DENSITOMETER MODULE, and slide the MODULE out far enough to expose the COVER for the DENSITOMETER/EXIT SENSOR (see Figure 7-23).
2. Connect your LAPTOP COMPUTER to the service port on the IMAGER.
3. Use “SecureLink” to connect to the IMAGER.
4. Launch the “Service WebLink”.
5. Check that a CARTRIDGE of transport film is loaded.
6. Start a film cycle:
   a. Select **Diagnostics>Test Prints>MCS Transport**.



b. Set the “Copies” window at 1.

c. Click [Run].

6. As the leading edge of the film comes up into the PROCESSOR:

   a. Insert a small strip of film under the COVER for the DENSITOMETER/EXIT SENSOR (Figure 7-23), to lift the ACTUATOR of the SENSOR. (This will prevent a “Jam in Area 5” error.) Leave the SENSOR actuated for 10 -15 seconds.

   b. Grasp and remove the film before it contacts the DRUM (see Figure 7-24).

7. Examine the film for scratches.

   - If the film **does not** have scratches, the problem is on the exit side of the PROCESSOR (FILM DIVERTER, FELT PAD, COOLING PLATE or DENSITOMETER turnaround). See paragraph 7-6-3.
   - If the film **does** have scratches, they are occurring in the FILM PLATEN or FILM TRANSPORT. See paragraph 7-6-4.

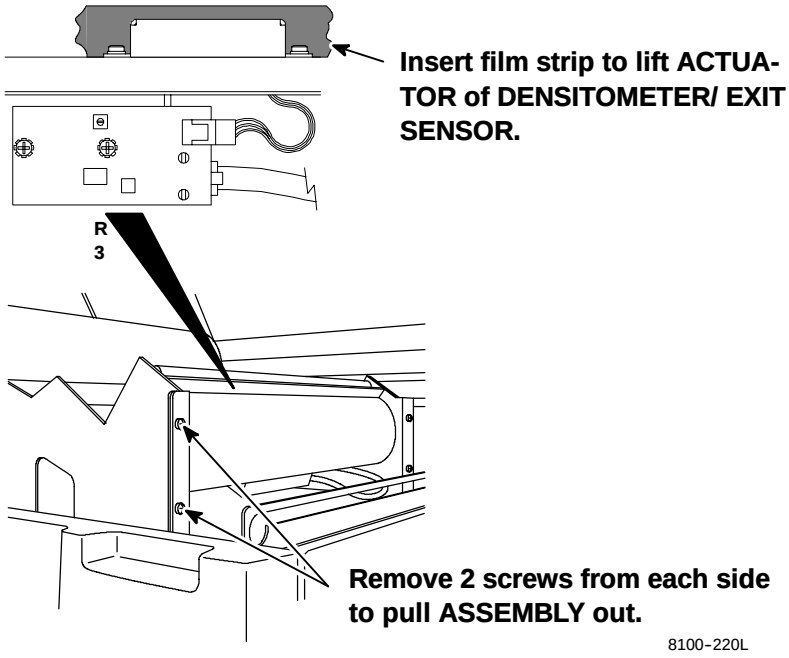

Insert film strip to lift ACTUATOR of DENSITOMETER/ EXIT SENSOR.
R3
Remove 2 screws from each side to pull ASSEMBLY out.
8100-220L

Figure 7-23. Actuating the DENSITOMETER/EXIT SENSOR

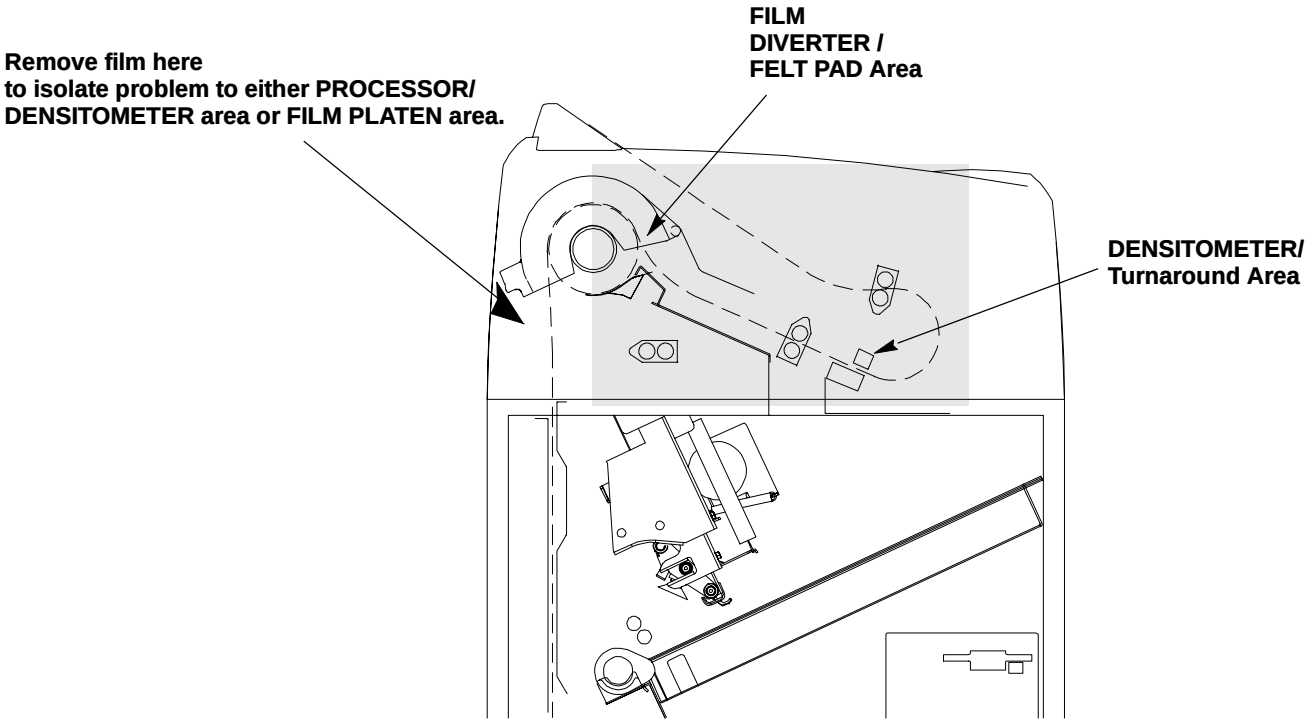


Figure 7-24. Locating the Source of Film Scratching

7-6-3. Locating the Cause of Scratching in the PROCESSOR/DENSITOMETER Area

1. Close and latch the PROCESSOR COVER.
2. Transport another sheet of film.
3. As the leading edge of the film arrives at the TRANSPORT ROLLERS just ahead of the DENSITOMETER TURNAROUND, use the strip of film to actuate the DENSITOMETER/EXIT SENSOR (to avoid a film jam error). Leave the SENSOR actuated for 10-15 seconds.
4. Grasp and remove the film before it enters the TURNAROUND.
5. Examine the film. If it does not have scratches, the problem is in the DENSITOMETER/TURNAROUND. If it has scratches the problem is ahead of the DENSITOMETER (FILM DIVERTER, FELT PAD, etc.). Advance to the next step to isolate the problem.
6. Lift the PROCESSOR HEAD SHIELD to expose the FILM DIVERTER and FELT PAD.
7. As the film enters the PROCESSOR, use the strip of film to actuate the DENSITOMETER/EXIT SENSOR.

Caution

The film is hot after it passes over the heated DRUM. Use gloves while grasping and handling it.

8. Grasp and remove the film just after it passes the FILM DIVERTER. DO NOT allow it to touch the FELT PAD.
9. Examine the film. If it has scratches, the FILM DIVERTER is the problem. If it does not have scratches, the problem is the FELT PAD or the COOLING PLATE.
10. See paragraph 7-6-5 for recommendations for removing the cause of film scratches.

7-6-4. Locating the Cause of Scratching in the FILM PLATEN

1. Remove the IMAGING MODULE (paragraph 4-11-1).
2. Inspect the INNER GUIDE of the PLATEN for debris or burrs.
3. Use an ALCOHOL PAD to wipe down the INNER GUIDE.
4. See paragraph 7-6-5 for recommendations for removing the causes of scratches.
5. If you are unable to eliminate the cause of scratching in the PLATEN any other way, replace the INNER GUIDE.

7-6-5. Guidelines for Removing the Causes of Scratches

The location of the scratches on film is the best guideline for locating the problem area precisely in the IMAGER. Observe the following suggestions:

1. Lightly rub the tips of your fingers over the suspected area. When you locate a burr or dirt, clean or polish to remove it.
2. Turn several sheets of film upside down in a CARTRIDGE and transport them through the IMAGER.

Note

The back side of the film is more abrasive than the emulsion side and sometimes cleans off debris that is hard to locate.

a. Under **Proxy Server**, uncheck “Use a proxy server.”

3. After disabling the Proxy Server, connect to MPC again using the web browser.
4. If you cannot connect to MPC, advance to **Step 1** in Message 2.

7-7. Monitoring the MCS Via a Direct CABLE Connection to the MCS BOARD

Use this procedure to monitor activity in the MCS and display the same types of information that are written to the logs. For example, if you suspect that the MCS is not booting correctly, you can set up a session, de-energize and energize the IMAGER, and observe the boot and initialization process on your LAPTOP COMPUTER.

1. De-energize the IMAGER.
2. Connect an MPC CABLE (standard DB9 to DB9) from the LAPTOP COMPUTER to the 9-pin CONNECTOR (J24) on the upper left corner of the MCS BOARD.
3. Using HyperTerminal, ProComm, or an equivalent communications application, set the following communication parameters:

   Baud rate = 9600, Data bits = 8, Parity = None, Stop bits = 1, Flow control = None
4. To display the Emulation screen, select **Properties>Setting**.
5. Set Emulation = VT 52 or VT 100.

Caution

While you are in monitoring mode, DO NOT type anything. This can damage the MCS software.

6. In the communications application, turn on logging to capture data when the IMAGER is energized.
7. Energize the IMAGER and observe the boot-up data.

Note

The following sample log of MCS operations at bootup does not include a printout of the operations that occur in the peripheral MICRO SYSTEMS such as the FEEDER BOARD, RF TAG BOARD, etc., with which the MCS BOARD communicates. The log does not provide information on detailed operations of the SENSORS and MOTORS controlled by the peripheral MICROS during bootup.

----------EXAMPLE OF A SUCCESSFUL MCS BOOTUP----------

To be supplied.

7-8. Using PCAnywhere

When using pcAnywhere, the password is case sensitive and the username is not.

7-8-1. pcAnywhere – Level 1

Purpose: Used to access the Local Panel.

Username pcanywhere

Password Netware28900

7-8-2. pcAnywhere – Level 2

Purpose: Used to access Internet Explorer (RMS Grouping).
To access, log on to level 1; log off; log on with username and password provided below.

Username pcanywhere

Password Netware28900

7-8-3. pcanywhere – Level 3

Purpose: Used to access DV8150 DRE Desktop. Need to use extreme caution when accessing the desktop, because with this username and password you have administrative capabilities.
To access, log on as level 1; log off; log on with username and password provided below.

Username RNIservicemanager

Password mliHxe597An{

7-9. Using Scripts

Scripts can be accessed using the Service Tool/Diagnostics. Scripts can be either Local (residing on your laptop) or Remote (residing in the software of the DV8150).

7-9-1. Remote Scripts

SetFacettoStretch2.vbs – sets the facet to stretch optics parameter to factory setting.

SetPixelStretch2.vbs – sets the pixel stretch optics parameter to factory setting.

SetSOSDelay2.vbs – sets the SOS Delay optics parameter to factory setting.

DisableComputerBrowserService.vbs – used to disable Computer Browser Service to reduce network traffic on the customer's network.

TriggerMPDB.vbs – used to tell the DV8150 to look for the Modality Preferences Database when the MPDB has been downloaded by Remote Management Services.

ListRMSServices.vbs – lists the status of the Remote Management Services (what is running).

CopyLPVideo.vbs – used to reload the Local Panel videos after ghosting new software.

7-9-2. Local Scripts

SetFacettoStretch2.vbs – allows setting the value different from the factory setting. Selection will be either 0 or 1. This changes the scanner mirror the machine will use and would affect the overall image.

SetPixelStretch2.vbs – allows setting the value different from the factory setting. Selection values up to 61556. When viewing an image on the light box, if this parameter were incorrect, you would see a slight shifting of the image (jagged edge on horizontal bars) on the top part of the film.

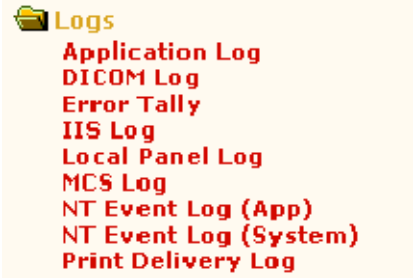
SetSOSDelay2.vbs – allows setting the value different from the factory setting. Selection values are from 0 to 255. This parameter will affect the top to bottom position of the image on the film.

ppp_ip_change.vbs – allows changing the DV8150 internal IP address that is used to communicate between the DRE and MCS. This script is used when a customer's LAN IP address is 10.X.X.X.

7-10. Using the Logs

7-10-1. Types of Log

The SERVICE TOOL includes 9 logs:



- Application Log – This log records the events controlled and monitored by all system software applications and subsystems.
- DICOM Log – This is a log of Network (DICOM) Subsystem events filtered from the Application Log. The Network Subsystem is part of the DRE application.
- Error Tally – This log records all error events in 2 separate tallies: a Current Tally, which counts and lists errors that have occurred since the last reset of this tally, and a Lifetime Tally, which counts all errors since installation of the system.
- IIS (Internet Information Server) Log – This log records all attempts to connect to the web server.
- Local Panel Log – This is a log of events in the Local Panel Subsystem, filtered from the Application Log. The Local Panel Subsystem is part of the DRE application.
- MCS Log – This is a log of MCS Subsystem events filtered from the Application Log. The log records all transactions between the peripheral MICROS and the MCS Master CPU that are transferred to the DRE application over the communications link between the MCS and DRE.
- NT Event Log (App) – This log records *Windows* events in the software applications.
- NT Event Log (System) – This log records *Windows* events in the system software.
- Print Delivery Log – This is a log of all Delivery Subsystem events filtered from the Application Log. The Delivery Subsystem is part of the DRE Application.

7-10-2. The Application Log

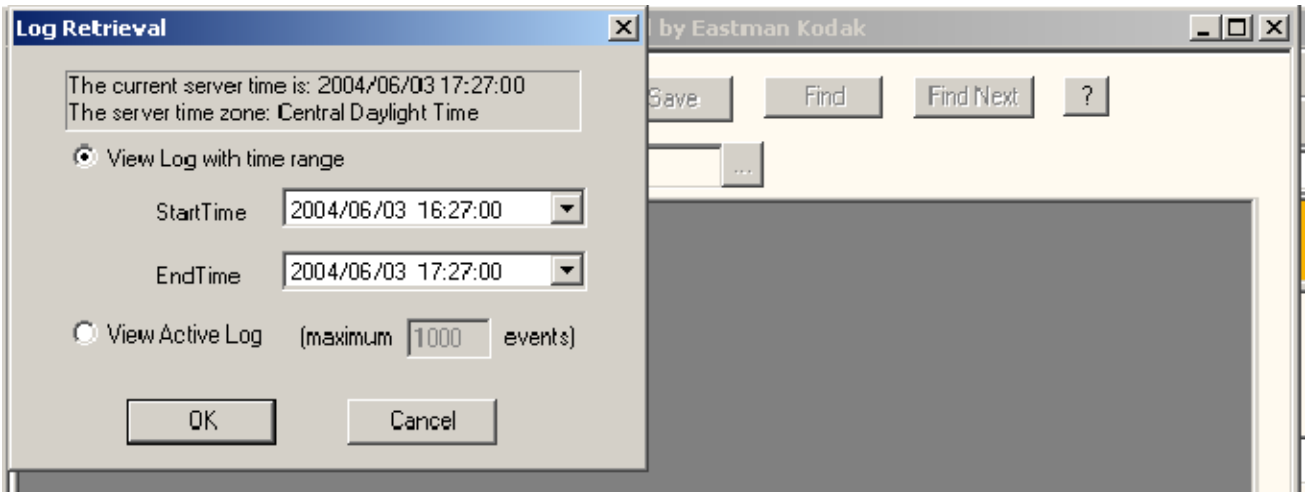
7-10-2-1. Using the Application Log

The Application Log and the subsystem logs which can be filtered from it are important troubleshooting resources. When an error occurs, you can search the logs to help locate the problem by checking the sequence of events leading up to the error. A typical troubleshooting sequence might involve:

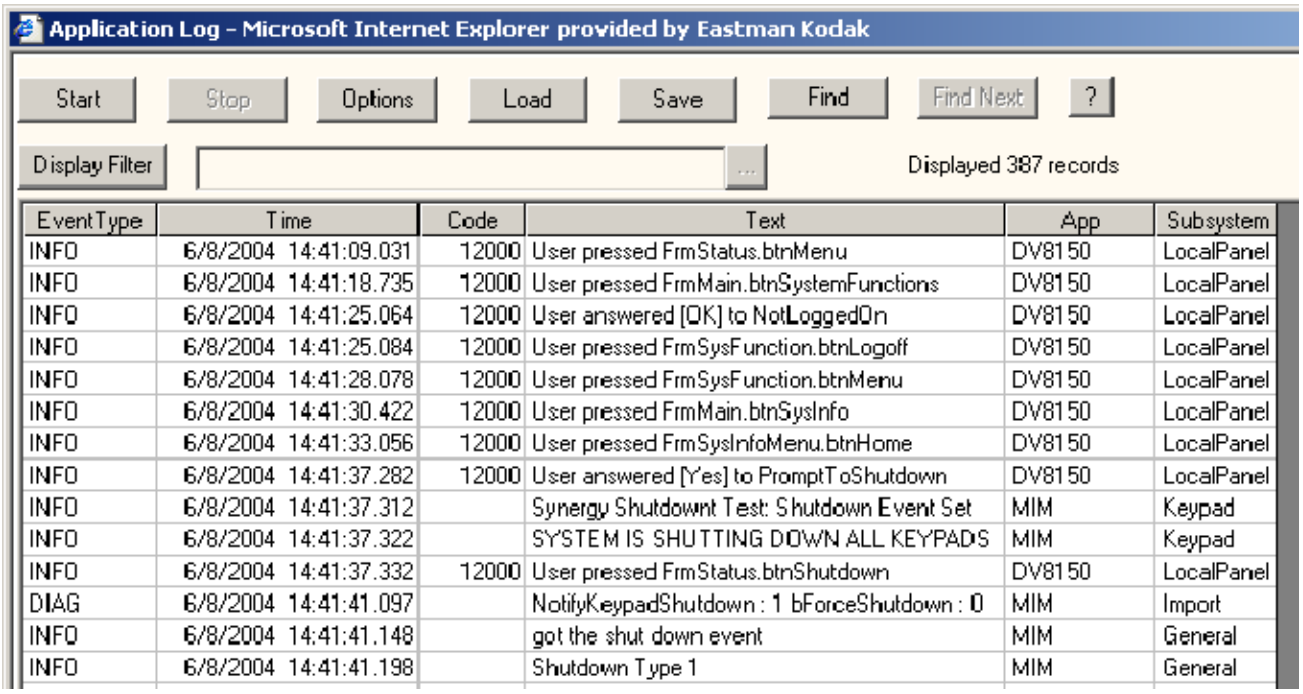
- Connecting your LAPTOP to the IMAGER and using SecureLink to access the SERVICE TOOL.
- Searching the Error Tally to determine how many times the error has occurred.
- Opening the NT Event (System) Log to determine the time at which the last error occurred.
- Searching the Application Log (or a subsystem log) for data at the time of the error.
- Examining the data in the log that precedes the error.
- If necessary, saving the log and sending it to the TSC or Service Engineering.

Techniques for searching the Application Log are described in the following procedures.

1. To access the Application Log, select **Logs>Application Log** from the main menu of the SERVICE TOOL. A blank log screen with a log retrieval window will appear.

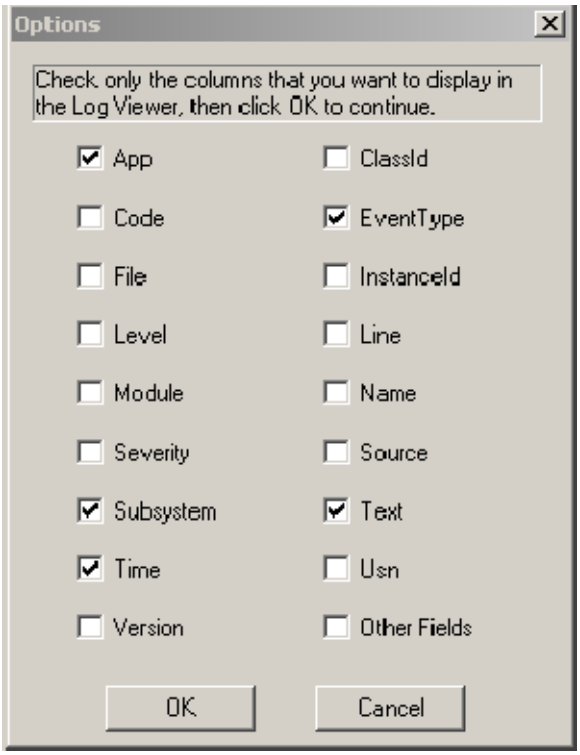


2. Use the Log Retrieval window to locate the log data you wish to view:
   - If you know the approximate time when the event you wish to view occurred, select “View Log with time range” and enter a Start and End Time.
   - If you wish to view the log of an event as it occurs, select “View Active Log.”
3. Click [OK]. The retrieved log will display.



EventType	Time	Code	Text	App	Subsystem
INFO	6/8/2004 14:41:09.031	12000	User pressed FrmStatus.btnMenu	DV8150	LocalPanel
INFO	6/8/2004 14:41:18.735	12000	User pressed FrmMain.btnSystemFunctions	DV8150	LocalPanel
INFO	6/8/2004 14:41:25.064	12000	User answered [OK] to NotLoggedOn	DV8150	LocalPanel
INFO	6/8/2004 14:41:25.084	12000	User pressed FrmSysFunction.btnLogoff	DV8150	LocalPanel
INFO	6/8/2004 14:41:28.078	12000	User pressed FrmSysFunction.btnMenu	DV8150	LocalPanel
INFO	6/8/2004 14:41:30.422	12000	User pressed FrmMain.btnSysInfo	DV8150	LocalPanel
INFO	6/8/2004 14:41:33.056	12000	User pressed FrmSysInfoMenu.btnHome	DV8150	LocalPanel
INFO	6/8/2004 14:41:37.282	12000	User answered [Yes] to PromptToShutdown	DV8150	LocalPanel
INFO	6/8/2004 14:41:37.312		Synergy Shutdownt Test: Shutdown Event Set	MIM	Keypad
INFO	6/8/2004 14:41:37.322		SYSTEM IS SHUTTING DOWN ALL KEYPADS	MIM	Keypad
INFO	6/8/2004 14:41:37.332	12000	User pressed FrmStatus.btnShutdown	DV8150	LocalPanel
DIAG	6/8/2004 14:41:41.097		NotifyKeypadShutdown : 1 bForceShutdown : 0	MIM	Import
INFO	6/8/2004 14:41:41.148		got the shut down event	MIM	General
INFO	6/8/2004 14:41:41.198		Shutdown Type 1	MIM	General

4. Click [Options] to display a screen showing the column heads of the log. You can use this screen to decrease the width of the log.



5. To decrease the log to a usable width, uncheck the column heads in the “Display field” that are of no use. The items checked above are the most useful for troubleshooting in the field. (The others are for software design use.)

Note

You can also decrease or expand column width in the log by selecting the lines between the column heads and moving the column left or right.

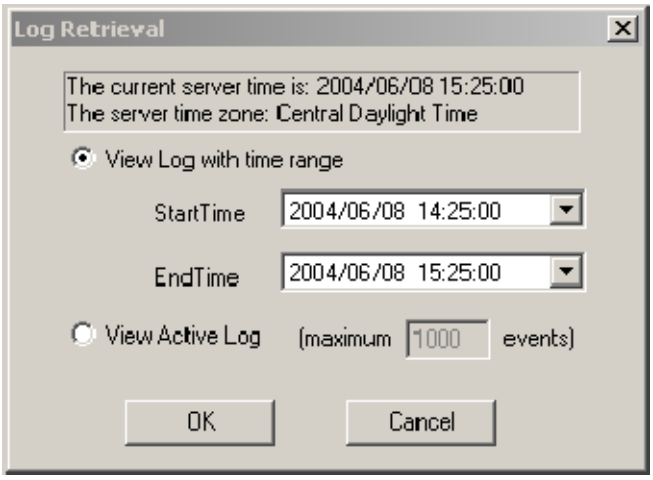
6. Click [OK].
7. Scroll the log, as necessary. See Sample Logs 1 and 2 at the end of this section for detailed examples of Application Logs.

Note

Use of the function keys at the top of the log screen are described in Log Keying Functions in the next paragraph.

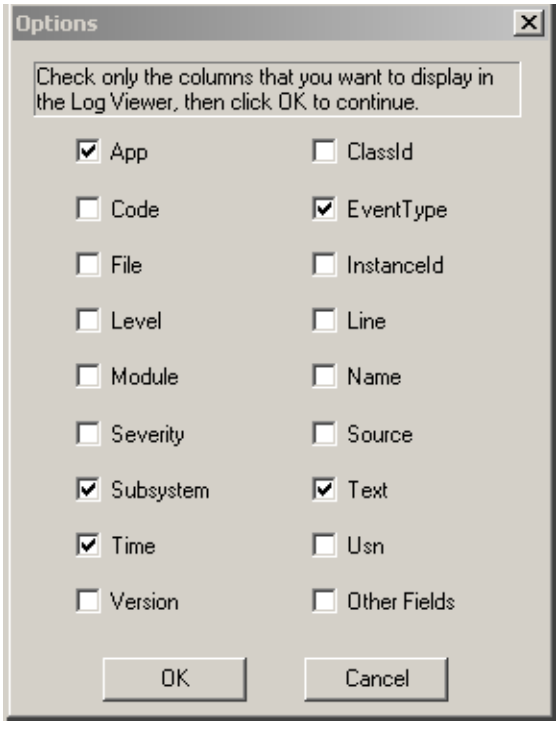
7-10-2-2. Log Keying Functions

1. **Start** – Click [Start] at any time to specify parameters for retrieving a new log. The Log Retrieval screen will display.



- If you know the approximate time at which an error occurred, select “View Log with time range,” and enter a Start Time and End Time which will include the time of the event you wish to review. Then click [OK].
- If you wish to view the log being written while an event occurs, select “View Active Log” and click [OK].

2. **Stop** – Click [Stop] at any time while a log is loading to stop the loading process.
3. **Options** – Click [Options] to display a screen for selection of the log columns you wish to display.

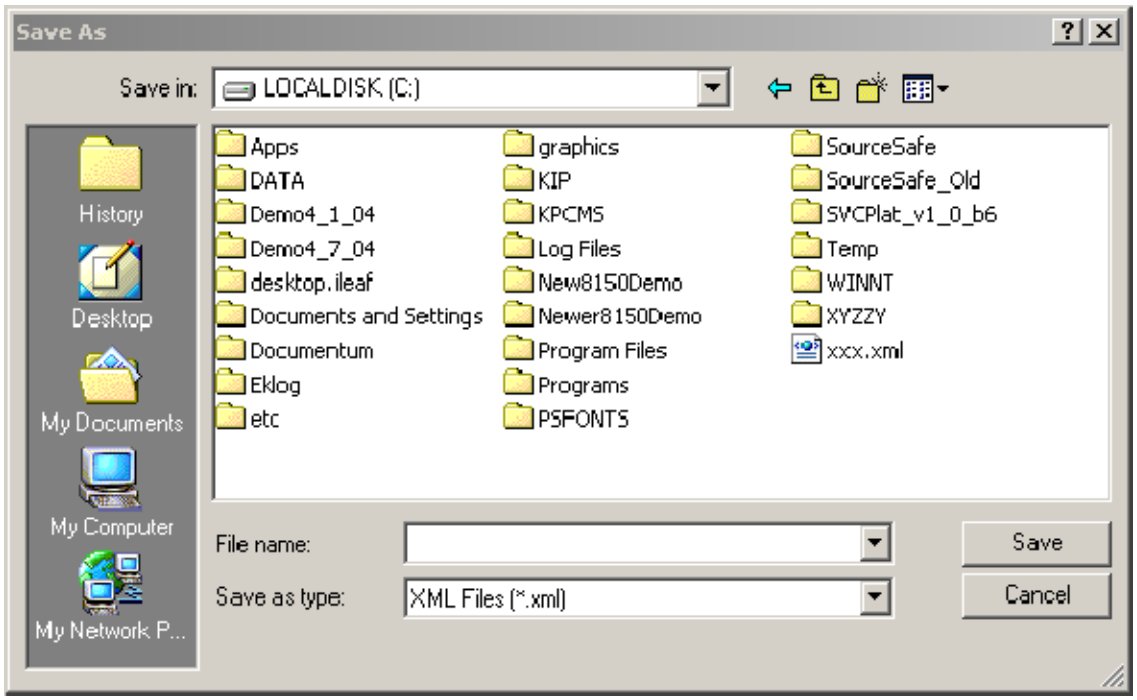


- Leave a checkmark next to the name of each column you wish to display in the log. The columns shown with checks above are the most useful for your purposes. See the next paragraph for descriptions of the functions of the columns.
- Click [OK] to display the log.

4. **Find** – Click [Find] to search for an area in the log that you can identify by words or numbers such as an error code.

- Enter the combination of words and numbers you want to locate in the “Find what” window.
- Click [Find] to search the log.

5. **Save** – Click [Save] to save a log to a folder on your LAPTOP.



- Use the cursor to select the area of the log you wish to save.
- Select the folder on the LAPTOP, for example “Log Files”.
- Enter a File name and click [Save].

Note

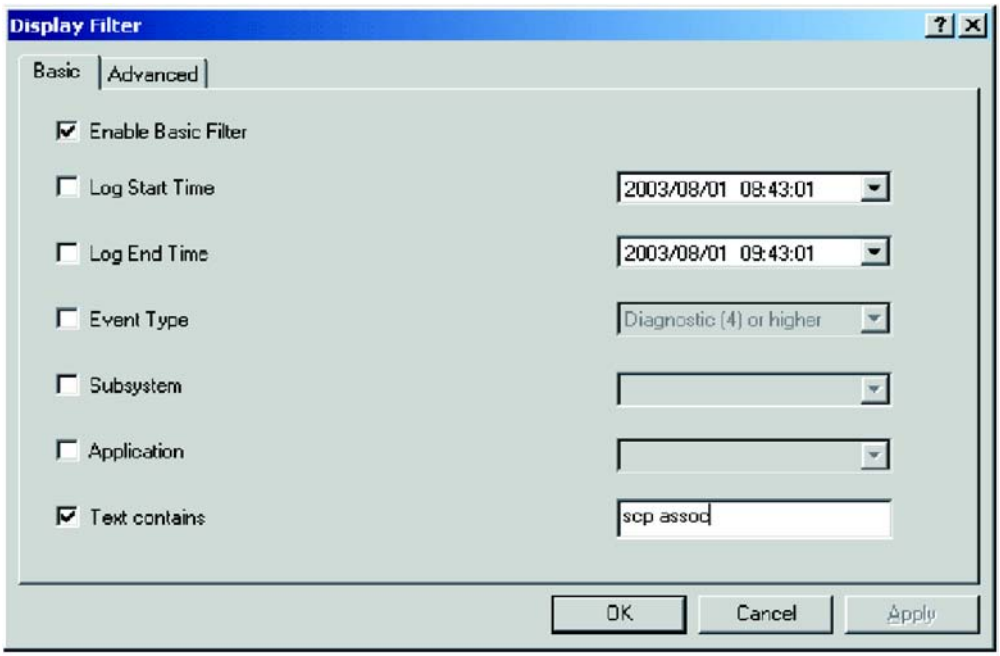
Your LAPTOP must have Local Log Viewer software to view the logs.

6. **Display Filter** – Click [Display Filter] to display a screen that will allow you to filter the log to decrease the quantity of log data for analysis. The next paragraph describes how to use this feature.

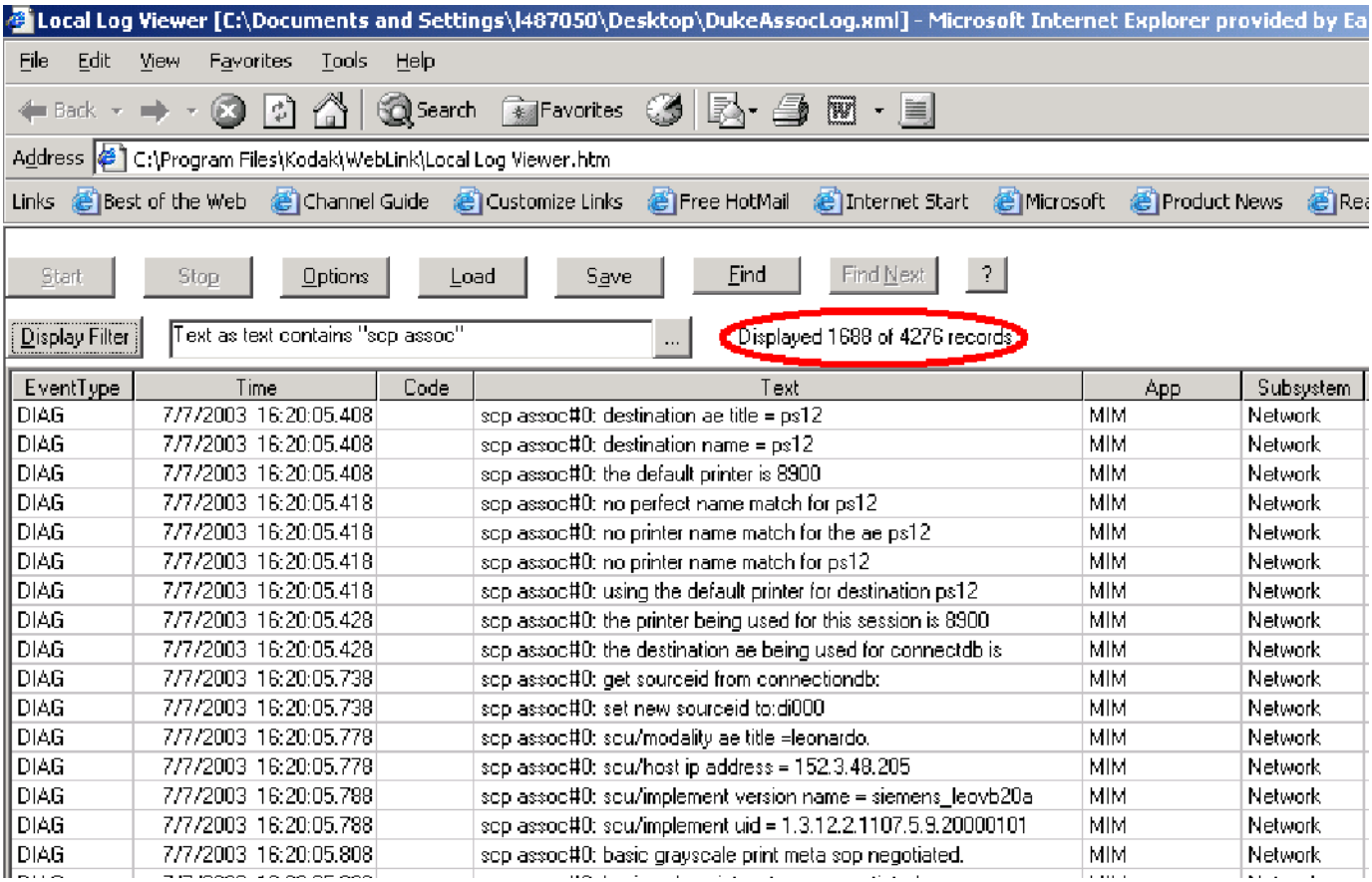
7-10-2-3. Using filtering

This paragraph explains how to use the filtering function to simplify searches in the Application Log. Assume the following IMAGER problem: Modalities are not able to target the IMAGER because the current number of SCP associations has reached and remains at the limit (12). You can use the filtering function to search for key words and numbers in the log to locate the information you need to solve the problem. See the following example search.

1. Access the Application Log and use the Log Retrieval window to select the time range within which the IMAGER problem occurred.
2. Click [OK] to capture the log data.
3. Select [Display Filter].

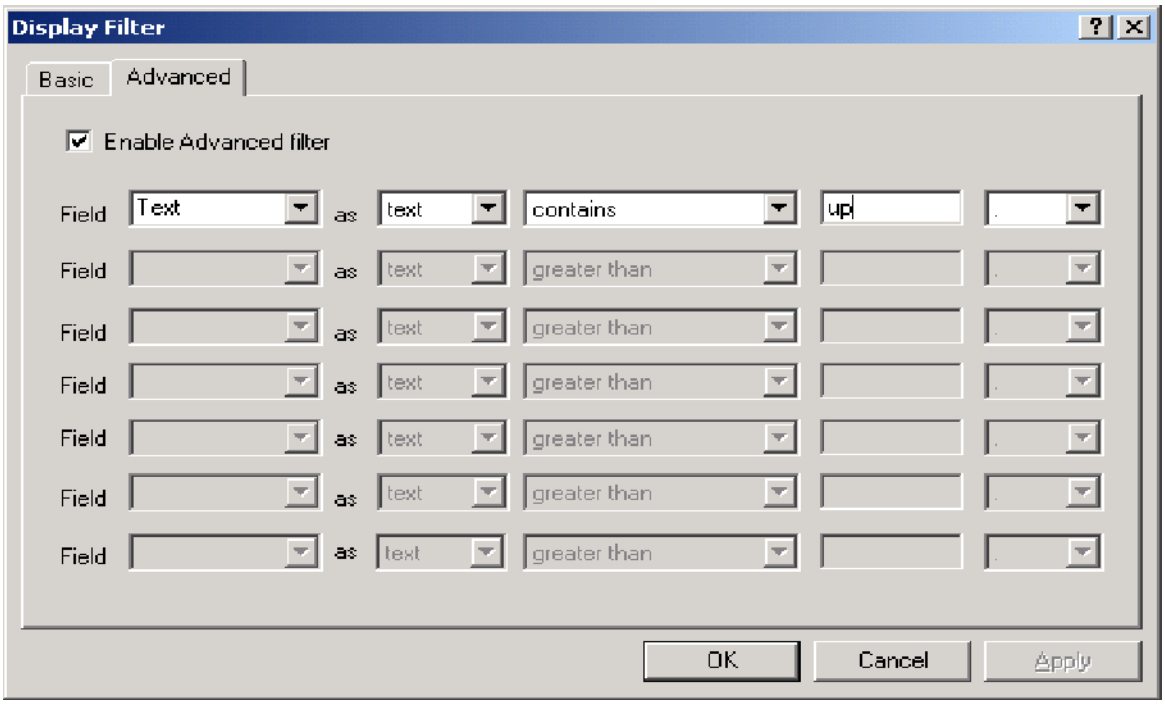


4. Under the “Basic” tab, check “Enable Basic Filter” and “Test contains”.
5. Type into the “Text contains” box the words and numbers that you wish to search on. In this example we have chosen “scp assoc” as words that will show up in the events in the log that we wish to examine.
6. Click [OK] to search the log for the selected text.

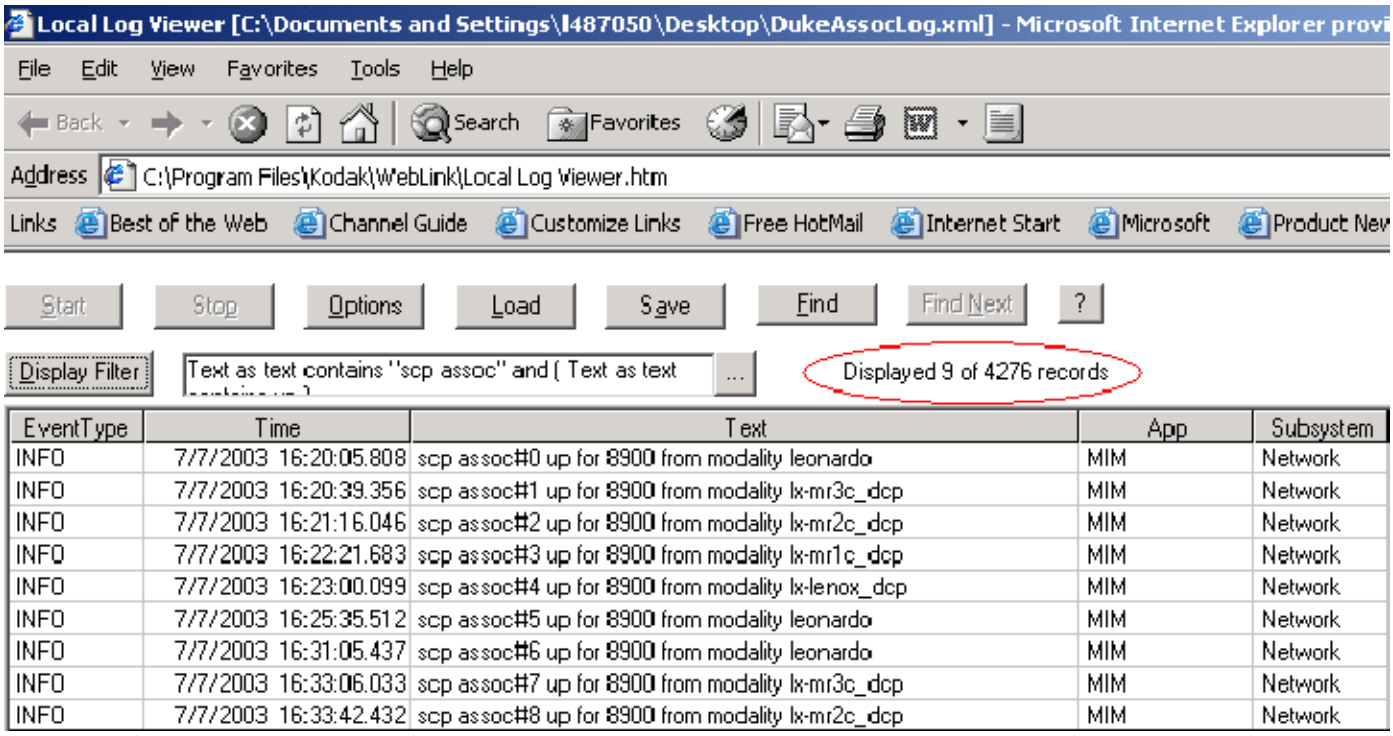

Local Log Viewer [C:\Documents and Settings\I487050\Desktop\DukeAssocLog.xml] - Microsoft Internet Explorer provided by Ea
File Edit View Favorites Tools Help
Back Search Favorites
Address C:\Program Files\Kodak\WebLink\Local Log Viewer.htm
Links Best of the Web Channel Guide Customize Links Free HotMail Internet Start Microsoft Product News
Start Stop Options Load Save Find Find Next ?
Display Filter
Text as text contains "scp assoc"
...
Displayed 1688 of 4276 records

EventType	Time	Code	Text	App	Subsystem
DIAG	7/7/2003 16:20:05.408		scp assoc#0: destination ae title = ps12	MIM	Network
DIAG	7/7/2003 16:20:05.408		scp assoc#0: destination name = ps12	MIM	Network
DIAG	7/7/2003 16:20:05.408		scp assoc#0: the default printer is 8900	MIM	Network
DIAG	7/7/2003 16:20:05.418		scp assoc#0: no perfect name match for ps12	MIM	Network
DIAG	7/7/2003 16:20:05.418		scp assoc#0: no printer name match for the ae ps12	MIM	Network
DIAG	7/7/2003 16:20:05.418		scp assoc#0: no printer name match for ps12	MIM	Network
DIAG	7/7/2003 16:20:05.418		scp assoc#0: using the default printer for destination ps12	MIM	Network
DIAG	7/7/2003 16:20:05.428		scp assoc#0: the printer being used for this session is 8900	MIM	Network
DIAG	7/7/2003 16:20:05.428		scp assoc#0: the destination ae being used for connectdb is	MIM	Network
DIAG	7/7/2003 16:20:05.738		scp assoc#0: get sourceid from connectiondb:	MIM	Network
DIAG	7/7/2003 16:20:05.738		scp assoc#0: set new sourceid to:di000	MIM	Network
DIAG	7/7/2003 16:20:05.778		scp assoc#0: scu/modality ae title =leonardo.	MIM	Network
DIAG	7/7/2003 16:20:05.778		scp assoc#0: scu/host ip address = 152.3.48.205	MIM	Network
DIAG	7/7/2003 16:20:05.788		scp assoc#0: scu/implement version name = siemens_leovb20a	MIM	Network
DIAG	7/7/2003 16:20:05.788		scp assoc#0: scu/implement uid = 1.3.12.2.1107.5.9.20000101	MIM	Network
DIAG	7/7/2003 16:20:05.808		scp assoc#0: basic grayscale print meta sop negotiated.	MIM	Network

7. Note that the search retrieved only log entries that include the words “scp assoc”. Also note that the log still includes 1,688 records, which is too much data to analyze. We need to filter further to decrease the data.
8. Again click [Display Filter], but this time select the “Advanced” tab.

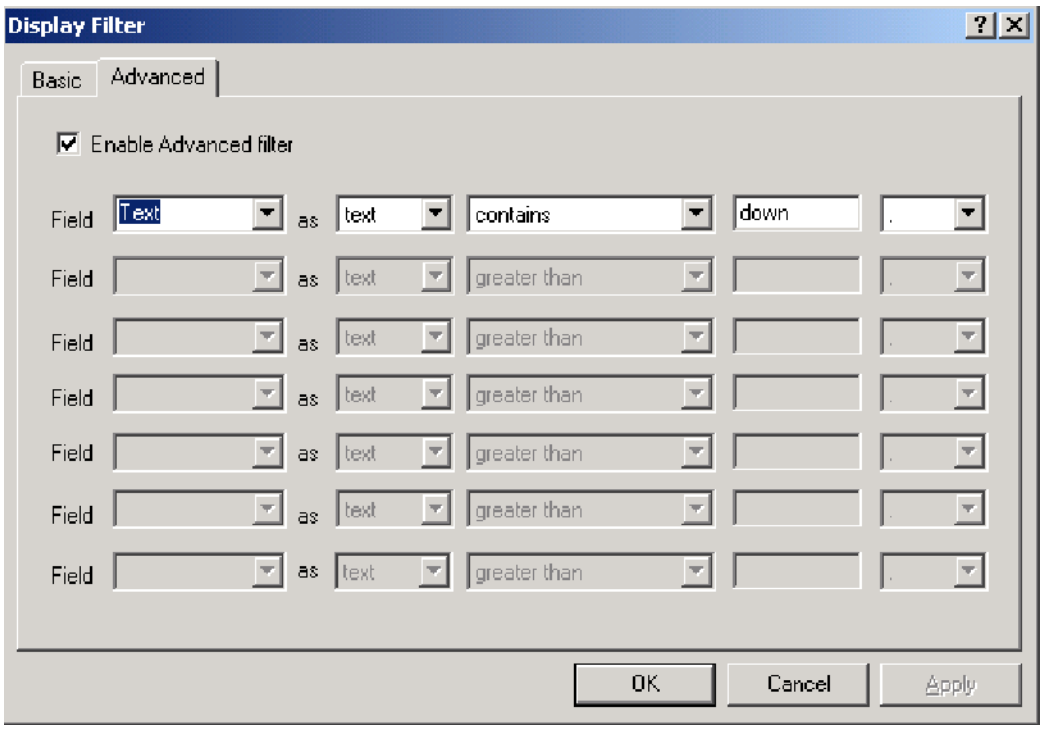


9. Check “Enable Advanced filter” and fill in the first Field boxes as shown above. This adds the word “up” to the original search words “scp assoc”.
10. Click [OK] to retrieve all the scp associations that were “up” (running) during the time that we selected.

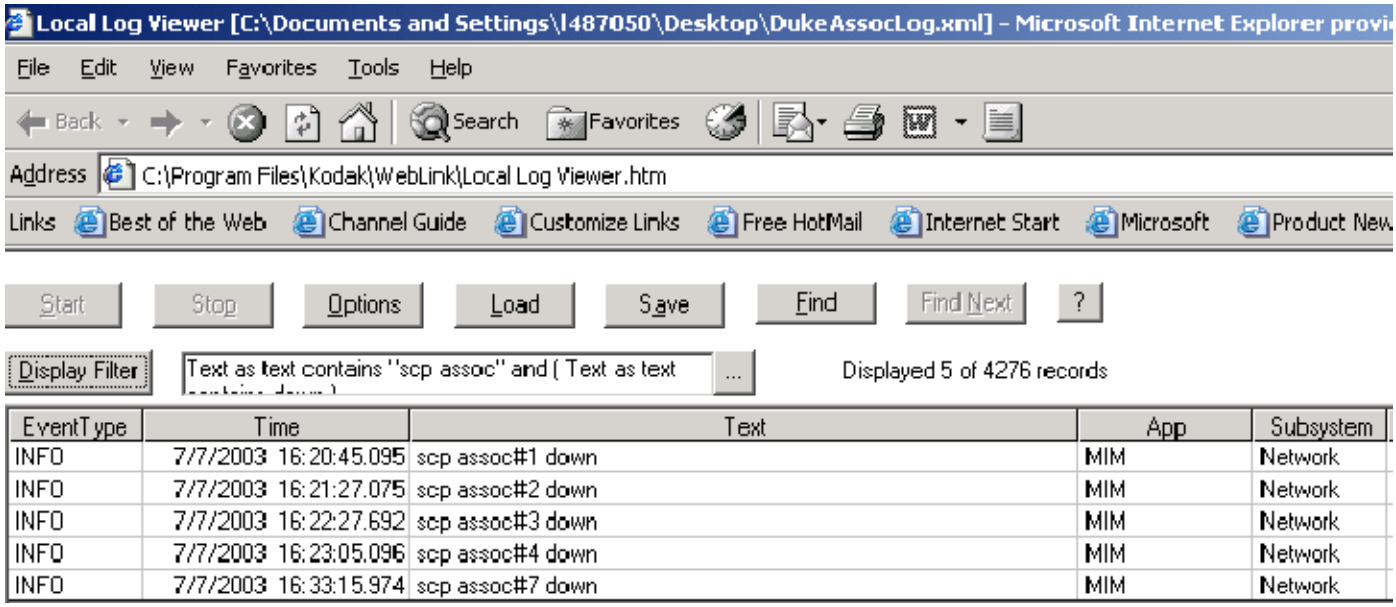

Local Log Viewer [C:\Documents and Settings\I487050\Desktop\DukeAssocLog.xml] - Microsoft Internet Explorer provi
File Edit View Favorites Tools Help
Back Search Favorites
Address C:\Program Files\Kodak\WebLink\Local Log Viewer.htm
Links Best of the Web Channel Guide Customize Links Free HotMail Internet Start Microsoft Product Nev
Start Stop Options Load Save Find Find Next ?
Display Filter
Text as text contains "scp assoc" and (Text as text
Displayed 9 of 4276 records

EventType	Time	Text	App	Subsystem
INFO	7/7/2003 16:20:05.808	scp assoc#0 up for 8900 from modality leonardo	MIM	Network
INFO	7/7/2003 16:20:39.356	scp assoc#1 up for 8900 from modality lx-mr3c_dcp	MIM	Network
INFO	7/7/2003 16:21:16.046	scp assoc#2 up for 8900 from modality lx-mr2c_dcp	MIM	Network
INFO	7/7/2003 16:22:21.683	scp assoc#3 up for 8900 from modality lx-mr1c_dcp	MIM	Network
INFO	7/7/2003 16:23:00.099	scp assoc#4 up for 8900 from modality lx-lenox_dcp	MIM	Network
INFO	7/7/2003 16:25:35.512	scp assoc#5 up for 8900 from modality leonardo	MIM	Network
INFO	7/7/2003 16:31:05.437	scp assoc#6 up for 8900 from modality leonardo	MIM	Network
INFO	7/7/2003 16:33:06.033	scp assoc#7 up for 8900 from modality lx-mr3c_dcp	MIM	Network
INFO	7/7/2003 16:33:42.432	scp assoc#8 up for 8900 from modality lx-mr2c_dcp	MIM	Network

11. Note that this search retrieved only 9 records, indicating that 9 associations were up during the time searched.
12. Perform another “advanced” search for scp associations that went “down” during the selected time.



13. Note in the retrieved data that only 5 associations are shown as “down”.


Local Log Viewer [C:\Documents and Settings\I487050\Desktop\DukeAssocLog.xml] - Microsoft Internet Explorer provi
File Edit View Favorites Tools Help
Back Search Favorites
Address C:\Program Files\Kodak\WebLink\Local Log Viewer.htm
Links Best of the Web Channel Guide Customize Links Free HotMail Internet Start Microsoft Product New
Start Stop Options Load Save Find Find Next ?
Display Filter
Text as text contains "scp assoc" and (Text as text
Displayed 5 of 4276 records

EventType	Time	Text	App	Subsystem
INFO	7/7/2003 16:20:45.095	scp assoc#1 down	MIM	Network
INFO	7/7/2003 16:21:27.075	scp assoc#2 down	MIM	Network
INFO	7/7/2003 16:22:27.692	scp assoc#3 down	MIM	Network
INFO	7/7/2003 16:23:05.096	scp assoc#4 down	MIM	Network
INFO	7/7/2003 16:33:15.974	scp assoc#7 down	MIM	Network

Note

A comparison of the scp assoc “up” and “down” logs indicate that the “leonardo” modality continued to add associations without closing down associations until apparently the limit of 12 associations was reached. This prevented new associations from occurring.

7-10-2-4. Contents of the Log

Each line of the log documents an “event”. Each event is divided into 16 columns of information. Only 4 or 5 of these columns are useful to the FE. (These are in bold in the list below.) The others contain data that is useful only to software design. To decrease the size of the log for viewing, these columns should be removed from the viewed log by means of the Options function described in the preceding paragraph. The columns, from left to right, include:

1. Event Type – This column provides the same information as the Level column. It indicates the level of log detail provided for the event. The levels from most detailed to lowest are: TRACE (Level 6), DEBUG (5), DIAG (4), INFO (3), WARNING (2), ERROR (1), and FATAL ERROR (0). Refer to paragraph 7-10-2-5.
2. Time– Provides the time of the event, down to 1/100th of a second. The time is useful mainly for locating events in the log.
3. Code – Code for a particular event. Normally an error code.
4. Text– This column describes the event.
5. App– The software application in which the event occurred. There are 3 applications: MIM, DV8150, and WebLink.

Note

The MIM application includes all software in the DRE that is common to other MIM systems. The DV8150 application includes the software that is specific to the MCS, but also DRE software such as the MCS Interface Server which was created specifically for the 8150 IMAGER and is not used in other MIM systems. The WebLink application is the service platform software.

6. **Subsystem** – The software subsystem within the application. These include subsystems of the MIM, DV8150, and Service WebLink, described in the tables below.

Subsystems for the MIM include:

MIM Subsystem	Description
Network (DICOM)	This subsystem negotiates with the SCU for delivery on the network of a job from the SCU. It then creates a Film Session, sets up the Film Box and Image Box(es). These activities will appear in the first few pages of the Application Log.
Import	This subsystem takes the images received from the network and processes them for storage on the HARD DISK.
Storage	This subsystem handles temporary storage of images on the HARD DISK and in MAIN MEMORY.
Delivery	This subsystem takes the image data from storage and renders it into pages for delivery through the MCS Interface Server to the MCS.
General	This subsystem handles general “overhead” software messages.

Subsystems for the DV8150 include:

DV8150 Subsystem	Description
AIQC	This subsystem involves all AIQC functions whether in the MCS or DRE
MCS	This subsystem handles all MCS hardware and software functions.
LOCAL PANEL	Controls all LOCAL PANEL functions.
MCS Interface Server	This subsystem delivers rendered images to the MCS and handles all communication between the MCS and DRE,

Subsystems for the Service WebLink include:

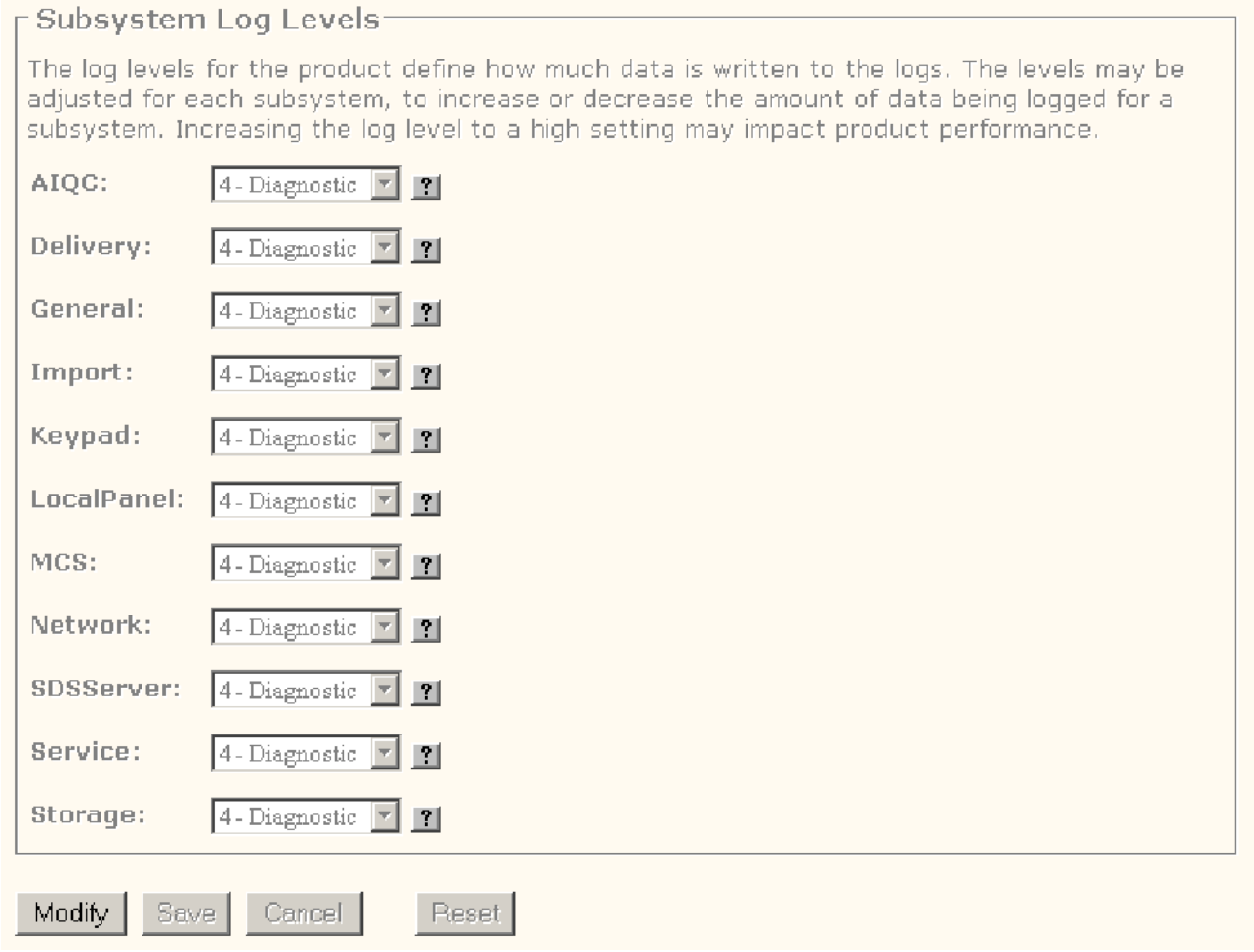
WebLink Subsystem	Description
Service	This subsystem controls all SERVICE TOOL functions.

7. Module – The software module within the subsystem
8. File – The file within the software module
9. Line – Line number of the file
10. **Level** – The level of detail used to describe the event. See Event Type above. See Log Levels in the next paragraph for information on changing the level for a subsystem.
11. –16. Class ID, Name, Source, Usn, Instance Id, and Version – These are software items of use only to the software designer.

7-10-2-5. Log Levels

The level of detail recorded in the logs for each Subsystem can be changed, if necessary, for troubleshooting purposes. To change a log level:

1. From the SERVICE TOOL menu, select **Configuration>System>Log Level**.



2. Click [Modify].
3. From the dropdown menu for the subsystem, select the Log Level you want and click [Save].

Note

The selectable log levels, from lowest detail to highest are:

- 0 – Fatal Error: Record only fatal errors
- 1 – Error: Record all errors
- 2 – Warning: Record warnings and all errors
- 3 – Information: Record key events
- 4 – Diagnostic: Provide a level of information useful for field troubleshooting.
- 5 – Debug: Provide a level of information useful for software debugging.
- 6– Trace:

Note

Levels of detail higher than the recommended defaults can slow down the system. If you change a level to help diagnose a problem, be sure to return the level to the default value after completing troubleshooting.

7-10-3. DICOM Log

This is a subsystem log that includes all MIM Network events pulled from the Application Log. Note that the Subsystem column includes only “Network”.

Time	Text	App	Subsystem
6/8/2004 16:09:14.017	SCP Assoc#1: Film Session Creation is Complete.	MIM	Network
6/8/2004 16:09:14.025	SCP Assoc#1: Create Film Box (FB) [N-CREATE] Indication Received (T)	MIM	Network
6/8/2004 16:09:14.027	SCP Assoc#1: Creating Film Box (FB) [N-CREATE]	MIM	Network
6/8/2004 16:09:14.029	SCP Assoc#1: FB get FilmSize from DB = 14INX17IN	MIM	Network
6/8/2004 16:09:14.029	SCP Assoc#1: FB FilmSize 14INX17IN from SCU	MIM	Network
6/8/2004 16:09:14.003	SCP Assoc#1: FB Using FilmSize 14INX17IN from SCU	MIM	Network
6/8/2004 16:09:14.003	SCP Assoc#1: FB Checking 14INX17IN BLUE FILM	MIM	Network
6/8/2004 16:09:14.341	SCP Assoc#1: FB using 14INX17IN BLUE FILM	MIM	Network
6/8/2004 16:09:14.351	SCP Assoc#1: FB Film Orientation: PORTRAIT from SCU	MIM	Network
6/8/2004 16:09:14.371	SCP Assoc#1: FB Image Display Format: STANDARD\1,1 from SCU	MIM	Network
6/8/2004 16:09:14.431	SCP Assoc#1: FB Min Density: 6.e-002 from SCU	MIM	Network
6/8/2004 16:09:14.441	SCP Assoc#1: FB Max Density: 2.5 from SCU	MIM	Network
6/8/2004 16:09:14.461	SCP Assoc#1: FB Border Density: BLACK from SCU	MIM	Network
6/8/2004 16:09:14.501	SCP Assoc#1: FB Trim: NO from SCU	MIM	Network
6/8/2004 16:09:14.521	SCP Assoc#1: FB Magnification Type: CUBIC from SCU	MIM	Network
6/8/2004 16:09:14.521	SCP Assoc#1: FB Smoothing Type from DB: 5	MIM	Network
6/8/2004 16:09:14.521	SCP Assoc#1: FB Smoothing Type from DB: 5	MIM	Network
6/8/2004 16:09:14.531	SCP Assoc#1: FB Magnification Type after interpolation: CUBIC	MIM	Network
6/8/2004 16:09:14.531	SCP Assoc#1: FB Smoothing Type after interpolation: NORMAL	MIM	Network
6/8/2004 16:09:14.551	SCP Assoc#1: Illumination missing defaulting to 2000 --> ERR_MSG[Missing	MIM	Network
6/8/2004 16:09:14.571	SCP Assoc#1: FB Reflected Ambient Light missing defaulting to 10 -->	MIM	Network
6/8/2004 16:09:14.591	SCP Assoc#1: Film Box Creation is Complete.	MIM	Network
6/8/2004 16:09:14.631	SCP Assoc#1: Create Film Box (FB) [N-CREATE] Confirmation Sent (T)	MIM	Network
6/8/2004 16:09:15.202	SCP Assoc#1: Setting Image Box (IB) [N-SET] Indication Received (T)	MIM	Network
6/8/2004 16:09:15.202	SCP Assoc#1: Setting Image Box (IB) for Position 1 [N-SET]	MIM	Network
6/8/2004 16:09:15.202	SCP Assoc#1: IB Rows: 512 from SCU	MIM	Network
6/8/2004 16:09:15.202	SCP Assoc#1: IB Columns: 512 from SCU	MIM	Network
6/8/2004 16:09:15.202	SCP Assoc#1: IB Bits Allocated: 16 from SCU	MIM	Network
6/8/2004 16:09:15.212	SCP Assoc#1: IB Bits Per Pixel (stored): 12 from SCU	MIM	Network
6/8/2004 16:09:15.212	SCP Assoc#1: IB High Bit: 11 from SCU	MIM	Network
6/8/2004 16:09:15.212	SCP Assoc#1: using Aspect ratio 1,1 --> ERR_MSG[Missing attribute]	MIM	Network
6/8/2004 16:09:15.222	SCP Assoc#1: IB Photometric Interpretation: MONOCHROME2 from SCU	MIM	Network
6/8/2004 16:09:15.302	SCP Assoc#1: IB Polarity Defaults to: NORMAL	MIM	Network
6/8/2004 16:09:15.302	SCP Assoc#1: IB Smoothing Type from FB: CUBIC	MIM	Network

7-10-4. Error Tally

The logs include 2 Error Tallies, or lists of machine errors.

- A Current Tally, which lists the number of errors that have occurred since the count for the errors was reset to 0.
- A Lifetime Tally, which lists the total count of all errors that have occurred during the lifetime of the machine.

1. To access the Error Tallies, connect your LAPTOP to the SERVICE TOOL via SecureLink and select Logs>Error Tally. The Current Error Tally will display.

Error Tally Information

Current | Lifetime

Current

The current error tally shows the number of times an error has occurred since the last time the count was reset. Select any error counts to be reset and select Reset. Only the "Current" values may be reset.

DryView 8150 S/N 810000000

Application	Error Code	Count	Last Cleared	Select
DV8150	0	1	Never	☐
DV8150	10910	400	Never	☐
DV8150	12003	117	Never	☐
DV8150	13001	100	Never	☐
DV8150	21115	1	Never	☐
DV8150	26163	1	Never	☐
MIM	165	49	Never	☐
MIM	250	1	Never	☐
MIM	300	48	Never	☐
MIM	1503	2	Never	☐
MIM	1505	2	Never	☐
MIM	1551	2	Never	☐

Note

The error codes in the tally are grouped by application: DV8150, MIM, or Service Platform. For descriptions of error codes, see the Quicksheets in this manual.

a. To reset the count for any error to 0, click [Select] for that error and then click [Reset] at the bottom of the screen.

b. If you wish to reset the count for all errors in the list, click [Select All] and then [Reset].

2. To access the Lifetime Tally, select “Lifetime”. Note that this screen does not include the Reset function.

Current | Lifetime

LifeTime

The lifetime error tally shows the number of times an error has occurred since product installation.

Serial Number 810000000

Application	Error Code	Count	Last Occurred
DV8150	0	1	2004-05-21
DV8150	10910	400	2004-06-08
DV8150	12003	117	2004-06-08
DV8150	13001	100	2004-06-08
DV8150	21115	1	2004-05-21
DV8150	26163	1	2004-05-21
MIM	165	49	2004-06-08
MIM	250	1	2004-05-26
MIM	300	48	2004-06-08
MIM	1503	2	2004-05-26
MIM	1505	2	2004-05-26
MIM	1551	2	2004-05-26
MIM	1904	1	2004-05-26
MIM	2058	1	2004-05-24
MIM	2064	1	2004-05-24

3. To save a Current or Lifetime Error Tally:
   a. Click [Save] on the bottom of the Error Tally screen.
   b. In the “Save Copy As” window, select the File Name of the folder on your LAPTOP where you wish to save the Tally.
   c. Click [Save].

Note

Your LAPTOP must contain Local Log Viewer software to view the saved log.

7-10-5. IIS Log

This “Internet Information System” log records all attempts to connect to the web server. In addition to the time of each event, the information in the log columns includes:

- Method –
- Protocol –
- Time Taken –
- URI Stem –
- Client IP –

Time	Method	Protocol	Client IP	Time Taken	URI Stem
6/8/2004 14:41:53	POST	200	127.0.0.1	10	/EKService/SOAPServer/SOAPServices.WSDL
6/8/2004 14:51:45	GET	200	127.0.0.1	981	/ekservice/default.asp
6/8/2004 14:51:45	GET	304	127.0.0.1	30	/ekservice/scripts/platformGlobals.js
6/8/2004 14:51:45	GET	200	127.0.0.1	130	/ekservice/default.asp
6/8/2004 14:51:45	GET	304	127.0.0.1	0	/EkService/objects/spControls.lpk
6/8/2004 14:51:45	GET	304	127.0.0.1	0	/ekservice/scripts/soapScripts.js
6/8/2004 14:51:46	GET	304	127.0.0.1	20	/ekservice/banner.html
6/8/2004 14:51:46	GET	304	127.0.0.1	0	/ekservice/basemenu.html
6/8/2004 14:51:46	GET	304	127.0.0.1	10	/ekservice/intro.html
6/8/2004 14:51:46	GET	304	127.0.0.1	0	/ekservice/footer.html
6/8/2004 14:51:46	GET	304	127.0.0.1	31	/EkService/styles/ServicePlatform.css
6/8/2004 14:51:46	GET	304	127.0.0.1	0	/EkService/scripts/soapScripts.js
6/8/2004 14:51:46	GET	304	127.0.0.1	0	/EkService/styles/ServicePlatform.css
6/8/2004 14:51:46	GET	304	127.0.0.1	0	/EkService/styles/menu.css
6/8/2004 14:51:48	GET	304	127.0.0.1	0	/EkService/styles/ServicePlatform.css
6/8/2004 14:51:48	GET	304	127.0.0.1	0	/EkService/styles/ServicePlatform.css
6/8/2004 14:51:48	GET	304	127.0.0.1	0	/EkService/scripts/banner.js
6/8/2004 14:51:48	GET	304	127.0.0.1	10	/EkService/images/DeviceIcon.gif
6/8/2004 14:51:49	GET	200	127.0.0.1	270	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:51	POST	200	127.0.0.1	892	/EKService/SOAPServer/SOAPServices.WSDL
6/8/2004 14:51:51	GET	200	127.0.0.1	100	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:52	GET	200	127.0.0.1	100	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:53	GET	200	127.0.0.1	90	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:54	GET	200	127.0.0.1	100	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:54	GET	200	127.0.0.1	90	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:56	GET	200	127.0.0.1	90	/ekservice/SOAPServer/SOAPServices.wsdl
6/8/2004 14:51:57	POST	200	127.0.0.1	771	/EKService/SOAPServer/SOAPServices.WSDL
6/8/2004 14:51:57	GET	304	127.0.0.1	0	/EkService/scripts/menuScripts.js
6/8/2004 14:51:57	GET	200	127.0.0.1	250	/EkService/pages/F4D9C319-757F-4AA4-9D32-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

7-10-6. Local Panel Log

This is a subsystem log that includes all events for the LOCAL PANEL filtered from an Application Log. Note that the Subsystem column includes only “LocalPanel”.

Time	Text	App	Subsystem
6/8/2004 16:31:18.765	User pressed FrmMain.btnSysInfo	DV8150	LocalPanel
6/8/2004 16:31:20.297	User pressed FrmSysInfoMenu.btnVersionInfo	DV8150	LocalPanel
6/8/2004 16:31:24.844	User pressed FrmVersionInfo.btnBack	DV8150	LocalPanel
6/8/2004 16:31:26.055	User pressed FrmSysInfoMenu.btnBack	DV8150	LocalPanel
6/8/2004 16:31:27.367	User pressed FrmMain.btnBack	DV8150	LocalPanel
6/8/2004 16:33:27.037	Screen Timeout occurred.	DV8150	LocalPanel
6/8/2004 16:33:27.064	Backlight Timeout occurred. Screen set to idle intensity.	DV8150	LocalPanel
6/8/2004 16:37:45.741	User pressed FrmStatus.btnMenu	DV8150	LocalPanel
6/8/2004 16:37:48.485	User answered [No] to PromptToUseInstallationAssistant	DV8150	LocalPanel
6/8/2004 16:37:48.525	User pressed FrmMain.btnSetupImager	DV8150	LocalPanel
6/8/2004 16:37:52.972	User selected listModalityConfiguration "Modality (SCU) config"	DV8150	LocalPanel
6/8/2004 16:37:55.946	User entry = [99]	DV8150	LocalPanel
6/8/2004 16:38:00.342	User entry = [987654]	DV8150	LocalPanel
6/8/2004 16:38:00.863	Local Panel Presentation Error Exception: Catastrophic failure	DV8150	LocalPanel
6/8/2004 16:38:00.943	Local Panel Presentation Error Exception: Catastrophic failure	DV8150	LocalPanel
6/8/2004 16:38:01.644	Local Panel Presentation Error Exception: Catastrophic failure	DV8150	LocalPanel
6/8/2004 16:38:02.626	Local Panel Presentation Error Exception: Catastrophic failure	DV8150	LocalPanel
6/8/2004 16:38:02.906	User pressed FrmModalityList.btnBack	DV8150	LocalPanel
6/8/2004 16:38:04.218	User pressed FrmSetupImager.btnBack	DV8150	LocalPanel
6/8/2004 16:38:05.029	User pressed FrmMain.btnHome	DV8150	LocalPanel
6/8/2004 16:38:08.304	User pressed FrmStatus.btnFilmTray	DV8150	LocalPanel
6/8/2004 16:38:09.666	User pressed FrmFilmSupply.btnRunDensityTest	DV8150	LocalPanel
6/8/2004 16:38:13.782	User selected listPrintFilm "Print film"	DV8150	LocalPanel
6/8/2004 16:38:16.496	User answered [OK] to ConfirmPrintRequested	DV8150	LocalPanel
6/8/2004 16:38:19.072	User pressed FrmDensityTestList.btnBack	DV8150	LocalPanel
6/8/2004 16:40:19.933	Backlight Timeout occurred. Screen set to idle intensity.	DV8150	LocalPanel
6/8/2004 16:40:19.933	Screen Timeout occurred.	DV8150	LocalPanel

7-10-7. MCS Log

This is a subsystem log that includes all MCS events pulled from an Application Log. These are events involving any of the micro subsystems on the MCS MicroComm bus. The MCS notifies the MIM (DRE) of the subsystem operation over the serial link between the MCS and the DRE.

Time	Text	App	Subsystem
6/8/2004 14:46:04.666	Densitometer diag passed	DV8150	MCS
6/8/2004 14:46:04.776	Start muOptics diagnostics	DV8150	MCS
6/8/2004 14:46:04.906	genericGetStatus: Optics showed RESET COMPLETE	DV8150	MCS
6/8/2004 14:46:05.006	muOptics diag rcode=60000	DV8150	MCS
6/8/2004 14:46:05.106	Exposer diag passed	DV8150	MCS
6/8/2004 14:46:05.247	Don't do optics diagnostics until calibrated	DV8150	MCS
6/8/2004 14:46:05.427	Processor warm time 2	DV8150	MCS
6/8/2004 14:46:05.547	OpticsCalib:laserSetAttenOpen - 3659	DV8150	MCS
6/8/2004 14:46:05.657	OpticsCalib:powerMonitorMin - 2492	DV8150	MCS
6/8/2004 14:46:05.867	powerMonitorOffset: 18	DV8150	MCS
6/8/2004 14:46:06.098	powerMonitorAttenOpen: 3706	DV8150	MCS
6/8/2004 14:46:06.298	pmAttenCalib: 0 3704	DV8150	MCS
6/8/2004 14:46:06.488	pmAttenCalib: 33 3702	DV8150	MCS
6/8/2004 14:46:06.609	Processor warm time 0	DV8150	MCS
6/8/2004 14:46:06.809	pmAttenCalib: 65 3651	DV8150	MCS
6/8/2004 14:46:06.999	pmAttenCalib: 98 3487	DV8150	MCS
6/8/2004 14:46:07.099	pmAttenCalib: 130 3202	DV8150	MCS
6/8/2004 14:46:07.279	pmAttenCalib: 163 2845	DV8150	MCS
6/8/2004 14:46:07.003	pmAttenCalib: 195 2479	DV8150	MCS
6/8/2004 14:46:07.004	pmAttenCalib: 228 2099	DV8150	MCS
6/8/2004 14:46:07.051	pmAttenCalib: 260 1786	DV8150	MCS
6/8/2004 14:46:07.071	pmAttenCalib: 293 1502	DV8150	MCS
6/8/2004 14:46:07.097	pmAttenCalib: 325 1258	DV8150	MCS
6/8/2004 14:46:08.081	pmAttenCalib: 358 1062	DV8150	MCS
6/8/2004 14:46:08.281	pmAttenCalib: 390 896	DV8150	MCS
6/8/2004 14:46:08.501	pmAttenCalib: 423 750	DV8150	MCS
6/8/2004 14:46:08.692	pmAttenCalib: 455 644	DV8150	MCS
6/8/2004 14:46:08.812	pmAttenCalib: 488 549	DV8150	MCS
6/8/2004 14:46:09.022	pmAttenCalib: 520 469	DV8150	MCS
6/8/2004 14:46:09.232	pmAttenCalib: 553 402	DV8150	MCS
6/8/2004 14:46:09.433	pmAttenCalib: 585 345	DV8150	MCS
6/8/2004 14:46:09.633	pmAttenCalib: 618 294	DV8150	MCS
6/8/2004 14:46:09.853	pmAttenCalib: 650 255	DV8150	MCS
6/8/2004 14:46:10.063	aodCalib: 0.000000	DV8150	MCS

7-10-8. NT Event Log (App)

This is a log of all Windows events related to software applications.

Time	Text	App	Computer
6/8/2004 14:41:51	[2103] KPDFrmPrc::Deactivate() - Forced thread termination -->	MIM	Dv8150Em
6/8/2004 14:41:51	No error occurred	RNIAppSrc	Dv8150Em
6/8/2004 14:42:08	The description for Event ID(156) in Source (RNIServiceManager) cannot	RNIServiceMa	Dv8150Em
6/8/2004 14:42:08	The description for Event ID(0) in Source (systemcontrol) cannot be found.	systemcontrol	Dv8150Em
6/8/2004 14:42:09	The service manager successfully initiated a system shut down.	RNIServiceMa	Dv8150Em
6/8/2004 14:42:09	The service manager successfully stopped.	RNIServiceMa	Dv8150Em
6/8/2004 14:42:18	17147 : SQL Server terminating because of system shutdown.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:41	Kodak SecureLink Server: Run() Service has started.	Kodak	Dv8150Em
6/8/2004 14:44:50	17052 : Microsoft SQL Server 2000 - 8.00.760 (Intel X86) Dec 17 2002	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:50	17104 : Server Process ID is 596.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:50	This instance of SQL Server last reported using a process id of 592 at	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:50	17162 : SQL Server is starting at priority class 'normal'(1 CPU detected).	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:51	17124 : SQL Server configured for thread mode processing.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:51	17125 : Using dynamic lock allocation. [500] Lock Blocks, [1000] Lock Owner	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:53	The description for Event ID(0) in Source (STService) cannot be found. The	STService	Dv8150Em
6/8/2004 14:44:54	The description for Event ID(0) in Source (STService) cannot be found. The	STService	Dv8150Em
6/8/2004 14:44:55	17834 : Using 'SSNETLIB.DLL' version '8.0.760'.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:55	19013 : SQL server listening on 149.98.199.120: 1433.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:55	19013 : SQL server listening on 192.168.0.1: 1433.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:55	19013 : SQL server listening on 127.0.0.1: 1433.	MSSQLSERVE	Dv8150Em
6/8/2004 14:44:57	Kodak Service Access: Run() Service has started.	Kodak	Dv8150Em
6/8/2004 14:45:00	SuperSocket info: (SpnRegister) : Error 1355.	MSSQLServer	Dv8150Em
6/8/2004 14:45:00	19013 : SQL server listening on TCP, Shared Memory, Named Pipes.	MSSQLSERVE	Dv8150Em
6/8/2004 14:45:00	17126 : SQL Server is ready for client connections	MSSQLSERVE	Dv8150Em
6/8/2004 14:45:01	17052 : Recovery complete.	MSSQLSERVE	Dv8150Em
6/8/2004 14:45:21	The description for Event ID(160) in Source (RNIServiceManager) cannot	RNIServiceMa	Dv8150Em
6/8/2004 14:45:21	The service manager successfully started.	RNIServiceMa	Dv8150Em
6/8/2004 14:45:21	The description for Event ID(161) in Source (RNIServiceManager) cannot	RNIServiceMa	Dv8150Em
6/8/2004 14:45:21	The service manager successfully started the MIM application.	RNIServiceMa	Dv8150Em
6/8/2004 14:45:21	Starting Kodak Secure Tunnel Logger: version v. 1.0.0.0 Ports: Web Browser:	Kodak	Dv8150Em
6/8/2004 14:45:21	Kodak SecureLink Server is ready to accept secure connections on port 443	Kodak	Dv8150Em
6/8/2004 14:45:29	The service manager failed to start. Error = 1056.	RNIServiceMa	Dv8150Em
6/8/2004 14:45:42	Software Licensing Failure	RNIAppSrc	Dv8150Em
6/8/2004 14:45:42	[165] AUTHORIZATION NOT PRESENT --> ERR_MSG [Software Licensing	MIM	Dv8150Em

7-10-9. NT Event Log (System)

This is a log of Windows events related to system software.

Time	Text	App
6/8/2004 14:41:48	The connection to MCS1 made by user guest using device COM3 was disconnected.	RemoteAcc
6/8/2004 14:42:19	The Event log service was stopped.	EventLog
6/8/2004 14:44:09	The description for Event ID(18) in Source (PCIOcom) cannot be found. The local computer	PCIOcom
6/8/2004 14:44:38	Microsoft (R) Windows 2000 (R) 5.0 2195 Service Pack 4 Uniprocessor Free.	EventLog
6/8/2004 14:44:38	The Event log service was started.	EventLog
6/8/2004 14:44:53	The User Mode Process Dump Driver service failed to start due to the following error: %%2	Service
6/8/2004 14:44:53	The User Mode Process Dump service depends on the User Mode Process Dump Driver	Service
6/8/2004 14:45:21	Instance 1 has invalid binding descriptor 0. For additional information specific to this message	W3SVC
6/8/2004 14:45:21	The service could not bind instance 1. The data is the error code. For additional information	W3SVC
6/8/2004 14:45:54	The user guest successfully established a connection to MCS1 using the device COM3.	RemoteAcc

7-10-10. Print Delivery Log

This is a subsystem log that includes all Delivery and SDS Server Subsystem events pulled from an Application Log. Note that the Subsystem column includes only these subsystems.

Time	Text	App	Subsystem
6/8/2004 16:09:12.918	Entering CreateOneShotRouting.	MIM	Delivery
6/8/2004 16:09:12.939	RoutingContext ctor	MIM	Delivery
6/8/2004 16:09:13.449	context State = EXECUTING	MIM	Delivery
6/8/2004 16:09:13.479	Media for current delivery job: Size = 8, Base = 2	MIM	Delivery
6/8/2004 16:09:13.479	Chosen Media: Size = 8, Base = 2	MIM	Delivery
6/8/2004 16:09:14.031	Media for current delivery job: Size = 8, Base = 1	MIM	Delivery
6/8/2004 16:09:14.321	Chosen Media: Size = 8, Base = 1	MIM	Delivery
6/8/2004 16:09:14.371	Set a Pivot Density to a DRYVIEW type, the action is complete but has no effect.	MIM	Delivery
6/8/2004 16:09:15.572	Page Closed.	MIM	Delivery
6/8/2004 16:09:15.582	PrintPages	MIM	Delivery
6/8/2004 16:09:15.592	#1 rcs 0 2 2 ImageStored	MIM	Delivery
6/8/2004 16:09:15.652	#1 rcs 1 1 0 PageClosed	MIM	Delivery
6/8/2004 16:09:15.662	#1 rcs 1 4 15 DocumentClosed	MIM	Delivery
6/8/2004 16:09:15.672	NetworkArbiter::QueueAdd - DV8150 is activating	MIM	Delivery
6/8/2004 16:09:15.672	RCS NextState = READY JOBREADY 3 PRINTING	MIM	Delivery
6/8/2004 16:09:15.963	init()	MIM	Delivery
6/8/2004 16:09:15.983	SetStandardFormat - SetImageDisplayFormat failed	MIM	Delivery
6/8/2004 16:09:16.023	sendDocument() start	MIM	Delivery
6/8/2004 16:09:16.023	8150::Job # = 1,START	MIM	Delivery
6/8/2004 16:09:16.023	sendDocument() pageCount = 1	MIM	Delivery
6/8/2004 16:09:16.023	sendDocument() numCopies = 1	MIM	Delivery
6/8/2004 16:09:16.033	sendDocument() CopiesFinished = 0	MIM	Delivery
6/8/2004 16:09:16.033	sendDocument() numCopies this Delivery will do = 1	MIM	Delivery
6/8/2004 16:09:16.033	sendDocument() UnCollated Printing!	MIM	Delivery
6/8/2004 16:09:16.033	CSDSPage::CSDSPage[0]. Film 0xffff Page Instantiated	DV8150	SDSServer
6/8/2004 16:09:16.043	CSDSServer::CreatePage. Created page #0	DV8150	SDSServer
6/8/2004 16:09:16.043	Bind bound to filmTray.	DV8150	SDSServer
6/8/2004 16:09:16.053	CImageBufferMgr::Allocate. Buffer "SMBuf_740_0" allocated	DV8150	SDSServer
6/8/2004 16:09:16.053	CLocal::StageFilm. Calling m_PrinterStageable.Wait().	DV8150	SDSServer
6/8/2004 16:09:16.333	CLocal::StageFilm sucess. FilmId: 0 (0x0)	DV8150	SDSServer
6/8/2004 16:09:16.333	CSDSPage::Stage[0]. Stage started	DV8150	SDSServer
6/8/2004 16:09:16.333	CMCSInterfaceClientLocal::CBStatusFilm. Film Id 0x0 Change StateChanged State	DV8150	SDSServer
6/8/2004 16:09:16.343	CLocal::MCSCBStatusFilm. Film Change = StateChanged State = MovingToExpose	DV8150	SDSServer
6/8/2004 16:09:16.343	CMCSInterfaceClientLocal::CBStatusFilm. Film Id 0x0 Change StateChanged State	DV8150	SDSServer

Section 8 – QuickSheets

8-1. Overview

This section provides information about three types of error messages:

- DICOM status messages from the IMAGER to the SCU.
- IMAGER status messages displayed on the LOCAL PANEL.
- IMAGER error codes displayed on the LOCAL PANEL.

8-2. DICOM Status Messages

In response to an N-GET message from a MODALITY, the IMAGER returns a status message along with a status information message to the MODALITY. If there is no system problem, the IMAGER returns the message “NORMAL.” If the IMAGER is in an error condition, it returns a FAILURE or WARNING message along with one of the 12 status information messages shown in the table below. If more than one error exists, only the highest priority information message is sent. The information messages are listed in priority order in the table below. Since the messages are few, they define only a general category of problems. A DICOM status information message is associated with each of the 5–digit error codes that identify specific problems in the IMAGER.

DICOM PRINTER Status Message	**DICOM PRINTER Status Information Message**
FAILURE Condition	PRINTER DOWN ELEC DOWN PROC DOWN
WARNING Condition	CALIBRATION ERR BAD SUPPLY MGZ COVER OPEN FILM JAM FILM TRANSP ERR EMPTY (media size, media type) PROC INIT PRINTER INIT PRINTER OFFLINE

8-3. LOCAL PANEL Status Messages

Message	**DICOM Status**	**Explanation**
MCS Printer Status		
Door Open	COVER OPEN	The FRONT DOOR is open or the REAR PANEL is off (or both).
Door Open Requested	N/A	The IMAGER is completing prints in process before opening the FRONT DOOR.
Drawer Open	COVER OPEN	The FILM CARTRIDGE is open.
Hood Open	COVER OPEN	The UPPER HOOD is open.
Printer Offline	PRINTER OFFLINE	Printing has been suspended.
Printing	NORMAL	The IMAGER is printing an image.
Ready	NORMAL	The IMAGER is on-line and the PROCESSOR is at operating temperature.

Self Test	PRINTER INIT	The IMAGER is performing its start-up self test. Please wait.
Service Mode	N/A	The SERVICE OVERRIDE Switch has been enabled.
Shutdown Initiated	PRINTER DOWN	The IMAGER is shutting down. No more associations will be accepted.
Shutdown Requested	PRINTER DOWN	Shutdown has been requested. Prints in progress will complete. No more associations are accepted. Existing ones are aborted.
Stopped	See QuickSheets.	An error condition has caused the IMAGER to stop. Refer to the error message on line 2 of the display.
System Shutting Down	PRINTER DOWN	The system is shutting down. New associations are not accepted.
Warming = xx	PROC INIT	The IMAGER is warming up. (xx = the number of minutes until the IMAGER will be ready to operate.)
Film Tray Status		
Calibrating...Please Wait	N/A	A calibration is in progress.
Fail	N/A	An error affecting normal operation has occurred.
No cartridge	N/A	There is no FILM CARTRIDGE in the TRAY.
Not Calibrated	N/A	Calibration must occur before the IMAGER can print.
Open	N/A	The FILM CARTRIDGE is open.
Opening...Please Wait	N/A	The FILM CARTRIDGE is opening.
Open Requested... Please Wait	N/A	A request to open the FILM CARTRIDGE has occurred.
Job Manager Status		
Offline	N/A	The IMAGER will not accept any DICOM job requests.
Active	N/A	The IMAGER is accepting DICOM job requests and film is available.
No Media	N/A	The IMAGER is accepting DICOM job requests, but film is not available for at least one current job.

8-4. Error Codes

8-4-1. Subsystems in the 8150 LASER IMAGER

Each subsystem in the IMAGER has an identification number (ID) which allows error histories for the subsystem to be retrieved and logs to be written, sorted, and retrieved by use of the ID. Each subsystem is assigned a range of error codes, which if possible are the same error codes used in earlier IMAGERS for similar problems. Errors within the IMAGER are identified by a sequence of 5 digits, consisting of the subsystem ID and the error code: for example 28–509. The first 2 digits in the example identify the PROCESSOR as the subsystem, and the following 3 digits identify the type of error (the PROCESSOR failed to warm up in time). The following table identifies the subsystems and their ID numbers.

Subsystem ID	Subsystem Name	Error Code Structure
PACSLink Software		
00	General PACSLink	00-xxx
01	Service Interface	01-xxx
02	Import	02-xxx
03	Delivery	03-xxx
04	Network	04-xxx
05	Storage	05-xxx
DRE (MIM)		
10	MCS Interface Server	10-xxx
11	Delivery Interface	11-xxx
12	Local Panel	12xxx
13	Service Tool	13-xxx
MCS		
20	General MCS	20-xxx
21	FILM PICKUP AND FEED	21-xxx
25	RF TAG	25-xxx
26	FILM TRANSPORT	26-xxx
27	OPTICS	27-xxx
28	PROCESSOR	28-xxx
29	DENSITOMETER	29-xxx

8-4-2. Error Severity Levels

- 0-Fatal – An error has occurred that cannot be reversed. The system will have to be “restarted.” The user will be notified.
- 1-Alert – A temporary problem has occurred, which can be corrected by the user.
- 2-Warning – An event occurred which the user should be notified of.
- 3-Notify – An event has occurred, but the system has automatically recovered.

8-5. Error Code QuickSheets

8-5-1. Error 00-099 through 00-530: Error Notification in General PACS Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	General Subsystem Error	NORMAL	3–Notify

Summary

All of these error codes indicate a software error in the General Subsystem. The cause of the error can be such things as object creation failure, a system call failure, or an incorrect license key.

Reeult of Error

None. The system will function normally

User Action

None

F\E Action

None

8-5-2. Error 01-001 through 01-910: Error Notification in Service Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Service Subsystem Error	NORMAL	3–Notify

Summary

All of these error codes indicate a software error in the Service Subsystem. The cause of the error can be such things as object creation failure, a system call failure, a logging error, a socket creation failure, a bind failure, an invalid parameter, or inability to find a restore file.

Result of Error

None. The system will function normally.

User Action

None

FE Action

None

8-5-3. Error 03-111: Rendering Error in Delivery Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Undelivered Job due to Rendering Error (Alarm sounds)	Job Rendering Error	NORMAL	1–Alert

Summary

There is a rendering error in the Delivery Subsystem caused by bad image data. This job will not be retried. The problem is in the data sent down from the MODALITY.

Result of Error

The DRE is functional, but this job will fail.

User Action

Delete the job from the Undelivered Queue.

FE Action

None

8-5-4. Error 03-381 through 03–912: Error Notification in Routing/Delivery Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Routing/Delivery Subsystem Error	NORMAL	3–Notify

Note

For Error Code 03-650, see the following QuickSheet (paragraph 8-5-5).

Summary

All of these error codes indicate a software error in the Routing/Delivery Subsystem. The cause of the error can be such things as object creation failure, a system call failure, a bad format, bad image processing values, delivery problems to the back end, and lost or irrecoverable image data.

Result of Error

The DRE should be functional, but the job may be sent to the Undelivered Queue.

User Action

None

FE Action

None

8-5-5. Error 03-650: Delivery Error Notification in Routing/Delivery Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Routing/Delivery Subsystem Job Delivery Error	NORMAL	3–Notify

Summary

An error has occurred in the job handling software of the Routing/Delivery Subsystem. The job will be retried.

Result of Error

The DRE is functional, but this job will fail.

User Action

None

FE Action

None

8-5-6. Error 04-004 through 04–215: Error Notification in DICOM/Network Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	DICOM/Network Subsystem Error	NORMAL	3–Notify

Note

For Error Codes 04-201 and 04-205, see the following two QuickSheets (paragraphs 8-5-7 and 8-5-8).

Summary

All of the error codes in this range indicate a software error in the DICOM/Network Subsystem. The cause of the error can be such things as object creation failure, a system call failure, connection refused, resource limitations, and invalid data.

Result of Error

Error 04–004 may cause the association to abort unexpectedly. Otherwise the system will function normally.

User Action

None

FE Action

None

8-5-7. Error 04-201: Maximum Number of DICOM Associations has been Exceeded

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	DICOM Associations Exceeded	NORMAL	3–Notify

Summary

The allowed number of DICOM associations (12) has been exceeded.

Note

When the system is shutting down, the maximum number is set to zero. Thus this error will occur if an SCU tries to connect when the IMAGER is shutting down.

Result of Error

The DRE is functional, but DICOM clients are not able to connect.

User Action

None

FE Action

None

8-5-8. Error 04-205: Resource Limitation Error in Network Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Resource Limitation Error in DICOM	NORMAL	3–Notify

Summary

The internal software of the Network Subsystem has a problem. The error can be caused by a number of problems, such as an object creation failure or a system call failure.

Result of Error

The DRE is functional, but DICOM clients may not be able to connect.

User Action

None

FE Action

8-5-9. Error 05-000: Error in Storage Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Storage Subsystem Error	NORMAL	3–Notify

Summary

The internal software of the Storage Subsystem has a problem, but the IMAGER should be able to function normally.

Result of Error

None. The system will function normally.

User Action

None

FE Action

None

8-5-10. Error 05-039: Unable to Reach Low Watermark

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Low Watermark Not Reached	NORMAL	3–Notify

Summary

The Storage Subsystem recovery software is not able to reclaim the optimal amount of storage defined by the Low Watermark. This is probably because there is a large number of jobs in the Pending or Undelivered Queues. There will be other messages to clean up the queues, such as:

- Alarms for jobs in the Pending Queue
- MCS Communications errors that result in jobs being sent to the Undelivered Queue
- Jobs being rejected because their space requirements exceed the disk space available

Result of Error

None. The system will function normally.

User Action

None

FE Action

None

8-5-11. Error 05-044: Low Watermark Has Been Reached

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None (No alarm)	Error in Storage Subsystem	NORMAL	3–Notify

Summary

The low watermark has been reached in the Storage Subsystem.

Result of Error

None. The system will function normally.

User Action

None

FE Action

None

8-5-12. Error 10-001: Delivery Subsystem Internal Software Error

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Delivery Server Internal Error – Alarm sounds	Delivery Server Internal Error	PRINTER DOWN	0–Fatal

Summary

The internal software of the Delivery Server Subsystem has a problem. The error can be caused by a number of problems, such as persistent memory failures, an object creation failure or a system call failure.

Result of Error

The DRE is not functional.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

8-5-13. Error 10-003: Image Datapath Error in Delivery Server Subsystem

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Delivery Server Image Datapath Error – Alarm sounds	Delivery Server Internal Error	PRINTER DOWN	0–Fatal

Summary

The image datapath software of the Delivery Server Subsystem has failed. The error can be caused by a number of problems, such as failure to create and initialize the MCSDIS software, failure of the PCIO BOARD or driver to initialize, or a read/write failure on the PCIO BOARD.

Result of Error

The DRE is not functional.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

8-5-14. 10-910: No Communication with the MCS

LOCAL PANEL Message	Log Message	DICOM Message	Severity
MCS Communication Down – Alarm sounds	MCS Communication Fail	ELEC DOWN	0–Fatal

Summary

This error, declared by the DRE, occurs when the MCS fails to respond to the DRE or communications between the two is interrupted. The most common cause of this error is disconnection of the flat cable between the DRE and the MCS BOARD in the MCS. This cable connects to another cable on the back of the DRE, which connects to the PCIO BOARD. All communications between the MCS and DRE occur on these cables. which both transfer image data and provide the serial link between the two. The only way to clear the error is to re–establish communications.

Result of Error

The IMAGER is unable to print films and films in progress will not be completed. The IMAGER can accept new jobs, but new films will not be initiated.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

Suspect components (in most likely order): software in MCS MICROS no compatible with DRE software, corrupt DRE software, bad PCIO BOARD, bad CABLES (or connections), bad HARD DRIVE.

There are 3 basic causes of the communication link failure that generates error 10–910:

1. The DRE failed to boot.
2. The MCS software is not compatible with the DRE software.
3. The DRE booted successfully but a hardware failure occurred, such as (in likely order) the PCIO BOARD in the DRE failed or the ribbon CABLE between the DRE and MCS is defective or has a bad connection.

8-5-15. 10.x.x.x Problem

For this type of problem, do the following:

1. Load the ppp_ip_change.vbs script onto your laptop.
2. Connect to the machine via WebLink.
3. Select **Diagnostics** > **Scripts**.
4. Using the script from Step 1, press the **Local** button and load the script. If you were not able to find the script, copy/paste or type these lines into the script window:

```
dim oShell, oExec,sLine,sNewIP, sPrompt, addArray, addStr, sVar

sPrompt = ”Make sure the IP Address is unique and is in the x.x.x.x subnet.”
sNewIP = InputBox(sPrompt, ”Enter new IP address (e.g. 172.16.254.1)”)

If sNewIP = ”” Then
MsgBox(”No changes made.”)
```

```
Else
Set oShell = CreateObject("WScript.Shell")
Set oExec = oShell.Exec("cmd /c " _
    & Chr(34) & "c:\DV8150\Utils\SetMcsPpp" & Chr(34) _
    & "  --conn MCS1 --ip " & sNewIP)
Do While Not oExec.StdOut.AtEndOfStream
 sLine = sLine & oExec.StdOut.Readline()
Loop

If sLine = "setmcsppp [--help] [--conn <connection name> --ip <ip address>] [--version]" Then
MsgBox("Bad input.  Make sure the IP is x.x.x.x where x is unique between (1 and 255)")
Else
addArray = Split(sNewIP, ".",-1,1)
addStr = addArray(0) & "." & addArray(1) & "." & addArray(2) & "." & (addArray(3) + 1)
oShell.RegWrite "HKLM\SOFTWARE\KHID\Fastball\MIB\IpAddress",addStr,"REG_SZ"
Script.Trace "MCS SNMP agent == " & oShell.RegRead("HKLM\SOFTWARE\KHID\Fastball\MIB\IpAddress")
Script.Trace "Power cycle the machine to make setting effect!"
MsgBox(sLine)
End If

End If
```

5. Select **RUN** and enter **192.168.1.150** as the new PPP IP address.
6. Power cycle the machine, and then both the DRE and MCS will work on the new subnet.

Loading Updated Modality Preferences Database via Kodak REMOTE MANAGEMENT SERVICES

For DRE version 1.0.1.b03, when the MPDB file is downloaded via the Kodak REMOTE MANAGEMENT SERVICES, the 8150 LASER IMAGER has to be triggered to look for the file. The script TriggerMPDB.vbs can be executed using the Remote Script function.

For DRE version 1.0.2.b04, this is no longer needed. The MPDB file loaded from REMOTE MANAGEMENT SERVICES should update properly without the trigger script.

Is REMOTE MANAGEMENT SERVICES Running?

When you press the **Start Service** button during the setup for REMOTE MANAGEMENT SERVICES, you did not know if the service had started unless you used pcAnywhere Software to check it. The status of REMOTE MANAGEMENT SERVICES can now be checked by running the ListRMSServices.vbs script from the Remote Script function. To view what the script has done, click on the Script RunTime tab.

You Ghosted the 8150 LASER IMAGER and you don't have Videos on the LOCAL PANEL

Load the Video CD (SP7F6699) into the 8150 LASER IMAGER CD drive and run the CopyLPVideo.vbs script using the Remote Script function.

8-5-16. Error 12-001: Software Error in LOCAL PANEL

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Local Panel System Error	NORMAL	3–Notify

Summary

The software of the LOCAL PANEL has a problem. The error can be caused by a number of problems, such as initialization, register/unregister observers, or registry access failures.

Result of Error

The DRE is not functional.

User Action

None

FE Action

8-5-17. Error 12-002: Database Error in LOCAL PANEL

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Local Panel Database Error	NORMAL	3–Notify

Summary

The database software of the LOCAL PANEL has a problem. The error can be caused by a number of problems, such as failure in database read/write or update operations.

Result of Error

The DRE is not functional.

User Action

None

FE Action

8-5-18. Error 12-003: Internal Software Error in LOCAL PANEL

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Local Panel Presentation Error	NORMAL	3–Notify

Summary

The internal software of the LOCAL PANEL subsystem has a problem. The error can be caused by a number of problems, such as persistent memory failures, object creation failure, or system call failures.

Result of Error

The DRE is not functional.

User Action

None

FE Action

8-5-19. Error 12-075: Error in LOCAL PANEL Software

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Local Panel Err	NORMAL	3–Notify

Summary

An internal error has been detected in the software of the LOCAL PANEL. The log message will contain additional details. The error can be caused by a number of problems, such as initialization, register/unregister observers, or registry access failures.

Result of Error

The operation of the LOCAL PANEL may be affected. Usually it will continue to operate after the error, but a specific functionality may be affected.

User Action

None

FE Action

8-5-20. Error 13-001: Error in SERVICE TOOL Software

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Service Tool Internal Error	NORMAL	3–Notify

Summary

An error has been detected in the internal software of the WebLink Subsystem. The error can be caused by a number of problems, such as persistent memory failures, object creation failure, a system call failure, or a Common Service Platform framework error.

Result of Error

Service operations may not work correctly. The DRE should be functional, but may not respond correctly to the service function being run, or the service function may fail.

User Action

None

FE Action

8-5-21. Error 13-002: Database Error in SERVICE TOOL Software

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Service Tool Database Error	NORMAL	3–Notify

Summary

An error has been detected in the database software of the WebLink Subsystem. The error can be caused by a number of problems, such as failures in database read/write or update functions.

Result of Error

Service operations may not work correctly. especially diagnostic functions. The DRE should be functional, but may not respond correctly to the service function being run, or the service function may fail.

User Action

None

FE Action

8-5-22. Error 13-003: SERVICE TOOL Script Error

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Service Tool Script Error	NORMAL	3–Notify

Summary

This error can be caused by a script with the following line: sysLog.log (”my user comment”).

Result of Error

Service operations may not work correctly. The DRE should be functional, but may not respond correctly to the service function being run, or the service function may fail.

User Action

None

FE Action

8-5-23. 20-137: Open DOOR Requested

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Wait for Door Open– Alarm sounds	Open Door Requested	NORMAL	3–Notify

Summary

The user has pressed the [Open Door] Key, but the IMAGER is printing and will not allow the DOOR to open. The IMAGER is unable to start another print cycle. Otherwise, it can operate as normal (acquiring, queuing prints, completing processing in progress, etc.).

Result of Error

The SYSTEM will not allow the user to open the FRONT DOOR while film is in process in the bottom of the IMAGER.

User Action

1. Wait until the films have entered the EXIT TRAY and the DOOR opens.
2. If the DOOR does not open:
    a. Shut down the IMAGER.
    b. Use the MANUAL OVERRIDE to open the DOOR.
    c. Manually clear films from the machine.

FE Action

This is an informational message only.

8-5-24. 20-202: SERVICE OVERRIDE SWITCH Out

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Override Switch Engaged– Alarm sounds	Override Switch Engaged	ELEC DOWN	1–Alert

Summary

The SERVICE OVERRIDE SWITCH has been enabled (i.e., placed in Service position). When this SWITCH is enabled, the SYSTEM does not recognize that the REAR PANEL is removed or the FRONT DOOR is opened. Thus the IMAGER will transport film, since MOTORS and SENSORS will operate. However the laser is powered off, so film is not imaged.

Result of Error

MOTORS and SENSORS will operate, since dc power (both hazard and nonhazard) is available. But RELAY K2 disables $\pm$ 12 volt dc laser drive power.

User Action

None

FE Action

The message is informational only.

8-5-25. 20-208: DOOR Fail Open

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Front Door Failed to Open–Alarm sounds	Front Door Failed to Open when Requested	NORMAL	1–Alert

Summary

The FRONT DOOR failed to open after the user pressed the Open Door key. The status of the door is monitored by the FRONT DOOR INTERLOCK SWITCH. After the FRONT DOOR is manually opened and closed, the SYSTEM will resume normal operation.

Result of Error

The SYSTEM is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.). New films will not be initiated.

User Action

1. Open the DOOR manually.
2. If the error persists, call Service.

FE Action

Check the MCS Log to attempt to isolate the problem. This error can be generated by any of the following problems:

1. A failed FRONT DOOR or REAR PANEL INTERLOCK (or INTERLOCK wiring), which indicates to the SYSTEM software an erroneous DOOR Status (i.e., information that the DOOR is already open). In this case the MCS BOARD will not deliver an “Open Door” command to the DOOR RELEASE SOLENOID.
2. A failed DOOR RELEASE SOLENOID or FET DRIVER for the SOLENOID (located on the MCS BOARD). In this case the MCS BOARD sends the “Door Open” signal, but the SOLENOID cannot respond.

Note

The DOOR RELEASE SOLENOID can fail in either an open or shorted state. If the SOLENOID is shorted, you will not be able to close the FRONT DOOR. If a SOLENOID fails, it will probably damage the FET DRIVER on the MCS BOARD, so both the SOLENOID and MCS BOARD will have to be replaced.

8-5-26. 20-550: Preventive Maintenance is Recommended

LOCAL PANEL Message	Log Message	DICOM Message	Severity
No error screen – Message “PM due: Call Service” displays	Preventive Maintenance Required	NORMAL	3–Notify

Summary

The film sheet count indicates that preventive maintenance is required.

Result of Error

None. The system will function normally.

User Action

Either a customer technician or a Kodak field engineer should perform periodic maintenance as described in the service manual. After maintenance, “prints until PM” should be reset via the SERVICE TOOL.

FE Action

This is an informational message only.

8-5-27. 20-912: Image Data Transfer Parity Error Detected

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Parity error detected in the image data transfer from the PCIO Card to Optics	NORMAL	3–Notify

Summary

The MCS has detected a parity error in the data transfer from the DRE. The DRE will immediately try to reprint. A clear vertical stripe about 1–mm wide will be printed across the 17–inch dimension of the film each time the error occurs. The error can be generated either by software or hardware.

Result of Error

The IMAGER may be able to continue printing normally. Affected films will be visibly marked as described above.

User Action

The error sometimes spontaneously clears itself. If it does not, the operator should restart the IMAGER. If this does not clear the error, a service call is required.

FE Action

Following are possible causes for this problem, listed in probable order of occurrence:

- Bad RIBBON CABLE or CABLE connection between the DRE and MCS
- Failed PCIO BOARD
- Failed MCS BOARD
- Malfunctioning DRE

8-5-28. 20-913: Data Transfer Count Error Detected

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Image Transfer Failure: Optics– Alarm sounds	Image transfer failed from PCIO Card to Optics	ELEC DOWN	0–Fatal

Summary

The MCS has detected that either an incomplete image (underrun) or too much image data (overrun) has been transferred to the optics. The error occurred either in the DRE or MCS. If the error occurred in the DRE, the DRE will immediately try to reprint, and a clear vertical stripe about 1 mm wide will be printed across the 17 inch dimension of the film each time the error occurs.

Result of Error

This error can be generated either by software or hardware problems.

User Action

The error sometimes spontaneously clears itself. If it does not, the operator should restart the IMAGER. If this does not clear the error, a service call is required.

FE Action

- If the error occurred in the MCS, the film will not be reprinted. Search the *mcs.log* for “over/underrun” or “20-913.”
- If the error occurred in the DRE, the film will be reprinted up to 5 tries. Search the log for “over/underrun” or “20-913.” You should also see “retrying” or “failed” in the log. On failure retries, the MCS/optics will repeat the same vertical line of data to the right of the clear stripe.
- The error can occur in the optics. Search the MCS log for “Optics NVRAM.” The optics *Serial Number SOS Delay*, and *Stretch* parameter values should be non-zero. (The *StretchID* parameter can be zero.) If Optics NVRAM problems occur, the SCANNER MODULE must be replaced.

8-5-29. Error 21-114: Film Pickup Failure before Opening or Closing a CARTRIDGE

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Pickup Fail during Rollback	Pickup diagnostics failed while opening or closing a cartridge	FILM TRANSP ERROR	1–Alert

Summary

A pickup problem occurred just before the CARTRIDGE was to be either opened or closed. Each time the CARTRIDGE is to be opened or closed, the pickup mechanism cycles to make sure it is positioned so it will not interfere with the LID of the CARTRIDGE. If the pickup cycle fails, this error is declared. It usually indicates that PICKUP MOTOR DCM2 or PICKUP POSITION SENSOR S3 failed.

Result of Error

The IMAGER is unable to print from the CARTRIDGE, but it is able to accept and queue print jobs.

User Action

1. Restart the IMAGER.
2. If the problem persists, call Service.

FE Action

Use the SERVICE TOOL to check the PICKUP MOTOR and PICKUP POSITION SENSOR.

8-5-30. Error 21-115: Film Pickup Retry Notification

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	Film Pickup Retry	NORMAL	3–Notify

Summary

This is a notification to the Log that the PICKUP ASSEMBLY has failed to pickup a film and place it into the feed area. If the problem remains after 2 attempts, error 21–116 is declared.

Result of Error

None. The system will function normally.

User Action

None

FE Action

None

8-5-31. Error 21-116: Film Pickup Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 1: Film Pickup (Alarm sounds)	Pickup Position Sensor (S3) failed to indicate that pickup has reached feeder nip transfer position	FILM TRANSP ERROR	1–Alert

Summary

The FEEDER BOARD has returned a “pickup fail” message after being commanded by the MCS BOARD to pick up film. The error is declared if after 2 tries the PICKUP ASSEMBLY has not been able to pick up up and place a film in the feed area, as indicated by PICKUP POSITION SENSOR S3. All other steps of the pickup operation must have completed successfully. Otherwise the error associated with the failed step will be indicated instead of this error.

Result of Error

The system is unable to print. Otherwise it can operate as normal: acquiring, queueing prints, completing processing, etc.

User Action

1. Touch the [Video] button to view the error video.
2. Touch the [Door] button to open the FRONT DOOR.
3. Clear any jammed film.
4. Close the CARTRIDGE manually.
5. Close the FRONT DOOR.
6. Run test prints to clear fogged film from the IMAGER.

FE Action

1. Use the SERVICE TOOL to check PICKUP POSITION SENSOR S3.
2. Remove the customer FILM CARTRIDGE and load a CARTRIDGE of transport film. Then cycle film and observe the film pickup operation (see paragraph 7-5-5-3).
3. Remove and inspect the FILM PICKUP ASSEMBLY as necessary (see paragraph 7-5-6-2).

8-5-32. Error 21-117: FILM FEED ROLLERS Failed to Close

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 1: Film Pickup– Alarm sounds	Feed Roller Position Sensor (S11) failed to indicate feed rollers have closed	FILM JAM	1–Alert

Summary

This error occurs if FEED ROLLER OPEN SENSOR S11 fails to indicate movement of the FEED ROLLERS from the open (home) position to the closed position. The SENSOR must sequence from Unblocked to Blocked to Unblocked.

Result of Error

The system is unable to print. Otherwise it can operate as normal: acquiring, queueing prints, completing processing, etc.

User Action

1. Touch the [Video]button to view the error video.
2. Touch the [Door] button to open the FRONT DOOR.
3. Clear any jammed film.
4. Close the CARTRIDGE manually.
5. Close the FRONT DOOR.
6. Run test prints to clear fogged film from the IMAGER.

FE Action

Use the SERVICE TOOL to check FEED ROLLER OPEN SENSOR S11.

8-5-33. Error 21-118: Pickup Failed to go Home

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure: Film Pickup (Alarm sounds)	Film Position Sensor (S3) failed to sense pickup assembly at Home position (Unblocked)	FILM TRANSP ERROR	1–Alert

Summary

The PICKUP ASSEMBLY failed to return to the home position at the end of a pickup cycle, as indicated by PICKUP POSITION SENSOR S3.

Result of Error

The system is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

7. If the error persists, call Service. See **Error 21–117**, **User Action**.

FE Action

Use the SERVICE TOOL to check PICKUP POSITION SENSOR S3.

8-5-34. Error 21-119: Pickup Did Not Contact Film

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure: Film Pickup (Alarm sounds)	Film Surface Sensor (S4) failed to confirm that pickup arm assy lowered and contacted film	FILM TRANSP ERROR	1-Alert

Summary

The FILM SURFACE SENSOR did not change from unblocked to blocked after the pickup arm left the home position.

Result of Error

The IMAGER is unable to pick up film and print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

8-5-35. Error 21-120: VACUUM CUPS Did Not Engage Film

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure: Film Pickup (Alarm sounds)	Cup Arm Position Sensor (S10) failed to confirm proper completion of a vacuum cup arm movement	FILM TRANSP ERROR	1-Alert

Summary

The CUPS ENGAGED SENSOR did not change from blocked to unblocked after the pickup arm contacted the film or did not complete the second film separation movement – down to up.

Sequence of Events

The IMAGER is unable to pick up film and print. It can still accept and queue new jobs.

Phone Fix – Operator Correctable

1. Restart the IMAGER.
2. If the error persists, call Service.

On-Site – Technician Correctable

1. Check the Application Log to isolate the problem.
2. Use the SERVICE TOOL to check the CUPS ENGAGED SENSOR.
3. Remove the REAR PANEL.
4. Check whether film has been pushed forward onto the adhesive on the CARTRIDGE. This can be caused by:
   - A film separation problem, perhaps caused by sticky film
   - A preceding film still remaining in the FEED ROLLERS
5. Check the VACUUM CUPS. They must be clean and undamaged. They must be screwed on snugly and not overtightened.

8-5-36. Error 21-131: ELEVATOR Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Tray Elevator Jammed– Alarm sounds	The elevator did not return to the home position (down) when the door was closed, or failed to raise tray before door opened	BAD SUPPLY MGZ	1-Alert

Summary

The ELEVATOR did not return to the home position after the DOOR was closed or failed to raise the ELEVATOR before the DOOR was opened. After a FILM CARTRIDGE is closed, the ELEVATOR MOTOR is turned on to raise the CARTRIDGE. As the ELEVATOR rises, its hub ACTUATOR lifts from ELEVATOR HOME SENSOR S12, and the SENSOR turns on. This indicates to the software that the ELEVATOR is rising. Before a CARTRIDGE is opened, the ELEVATOR is lowered. When the hub ACTUATOR reaches home, it interrupts SENSOR S12 and the SENSOR turns off, indicating to the software that the ELEVATOR is home. If S12 does not turn on or off as required, the error is declared. Probable causes of the error include a defective SENSOR or ELEVATOR MOTOR.

Result of Error

The printer is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Use the SERVICE TOOL check the ELEVATOR HOME SENSOR (paragraph 7-4-1-1).
2. Check that the ELEVATOR MOTOR operates as follows:
   a. Press the [Door Open] key to close the FILM CARTRIDGE.
   b. Remove the REAR PANEL and set the SERVICE OVERRIDE SWITCH in the Service position.
   c. Power cycle the IMAGER and observe that the ELEVATOR STEPPER MOTOR cycles.
3. If the ELEVATOR STEPPER MOTOR does not operate, check for Hazard +12 vdc at the test point on the MCS BOARD. (Refer to sheet 2 of the SYSTEM functional diagrams.) If Hazard +12 volt power is not there, suspect the REAR PANEL INTERLOCK or RELAY K1 on the MCS BOARD. If Hazard +12 volt power is present, check the power CABLE between J15 on the MCS BOARD and J3 on the FEEDER BOARD. (Also check wiring to the MOTOR.) If power is present and the wiring between components appears to be OK, either the MOTOR is bad or the MOTOR DRIVER CHIP on the FEEDER CONTROL BOARD has failed.

8-5-37. 21-132: No Supply CARTRIDGE

LOCAL PANEL Message	Log Message	DICOM Message	Severity
No Cartridge– Alarm sounds	No cartridge in supply drawer	NORMAL	3– Notify

Summary

The presence of a CARTRIDGE has not been detected by CARTRIDGE PRESENT SENSOR S1. Thus either a CARTRIDGE is not loaded or the SENSOR is defective. When a CARTRIDGE is inserted, it contacts the flag ACTUATOR of CARTRIDGE PRESENT SENSOR S1, causing the SENSOR to conduct. The SENSOR signal indicates that a CARTRIDGE is installed. A defective SENSOR will result in a false error indication.

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

User Action

The operator should open the FRONT DOOR and load another CARTRIDGE.

FE Action

Normally this is a routine message that a FILM CARTRIDGE is not loaded. However, if this error occurs with a CARTRIDGE loaded, you can assume that there is a problem with CARTRIDGE PRESENT SENSOR S1.

Use the SERVICE TOOL to check SENSOR S1 (paragraph 7-4-1-1).

8-5-38. 21-134: Supply CARTRIDGE Empty

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Cartridge Empty– Alarm sounds	Cartridge is empty	EMPTY MEDIA (Size and Type)	1– Alert

Summary

The supply CARTRIDGE is out of film. When this occurs, the MCS immediately indicates a media out condition to the DRE and begins to close the CARTRIDGE. When the PICKUP CARRIAGE is driven down by the PICKUP MOTOR to contact the film, the following sequence occurs: FILM SURFACE SENSOR S4 contacts the bottom of the CARRIAGE, if it is empty of film, and turns on, but FILM OUT SENSOR S5 does not actuate because of the hole in the bottom of the empty CARTRIDGE. This sequence signals to the MCS an out-of-film condition. The MCS stops the PICKUP MOTOR, then returns the PICKUP CARRIAGE to home.

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

Phone Fix – Operator Correctable

The operator must open the FRONT DOOR, remove the CARTRIDGE, and install a new CARTRIDGE. The error will clear automatically.

On-Site – Technician Correctable

This is an informational message only.

8-5-39. 21-138: User Intervention Required to Open DOOR

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Override Door Open– Alarm sounds	Operator action required to open door with cartridge stuck open	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER is unable to open the FRONT DOOR because the supply CARTRIDGE would not close. When the user keys in the command to open the FRONT DOOR, the SYSTEM software attempts to close the CARTRIDGE. If this fails, the attempt is repeated once. If the CARTRIDGE will not close, the error is declared.

Result of Error

The IMAGER is unable to print. It can still accept and queue jobs.

User Action

1. Touch the [Video] button to view the error video.
2. Touch the [Door] button to open the FRONT DOOR. This will clear the error.
3. Close the CARTRIDGE manually. See note below.

Caution

The user should not attempt to close the CARTRIDGE while this error state is in effect. If a jammed film is caught by the ROLLBACK as the CARTRIDGE is closed, it will damage the FILM GUARD.

4. Close the FRONT DOOR.
5. Run test prints to clear fogged film from the IMAGER.
6. If the error persists, use a new CARTRIDGE.

FE Action

This is an informational message only.

8-5-40. 21-139: Bad CARTRIDGE ID

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Unable to Identify Film– Alarm sounds	RF Tag Reader failed to Read or Write RF Tag data on film cartridge	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER is unable to read the ID information on the supply CARTRIDGE. The IMAGER attempts to read the RF Tag in the CARTRIDGE whenever the front door is closed and at power up. If after 5 attempts it is unsuccessful, it declares the error and closes the CARTRIDGE.

Result of Error

The IMAGER is unable to print. It can still accept and queue jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

1. Check the MCS Log to determine the point at which the error occurred. This error may be the result of a reset triggered by noise or a CABLE problem. This can happen even if the RF TAG SUBSYSTEM passed its power-up test.
2. Use the SERVICE TOOL to check the RF TAG SUBSYSTEM as instructed in paragraph 7-2-5.

8-5-41. 21-145: Unsupported Media Type

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Unsupported Media Type– Alarm sounds	Media Type located in Drawer is not supported	BAD SUPPLY MGZ	1–Alert

Summary

The RF TAG information indicates that the type of media in the CARTRIDGE is incompatible with the IMAGER. Whenever a new CARTRIDGE is loaded or the IMAGER is powered on, the software reads the RF TAG on the bottom of the CARTRIDGE to identify the media type, size, CE mark, and CR mark information. This error occurs if the media type is wrong. It can also occur if the IMAGER has been configured to reject the CE/CR mark.

Result of Error

The IMAGER is unable to print. It can still accept and queue print jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

This is an informational message only.

8-5-42. 21-146: Wrong Media Size

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Unsupported Media Size– Alarm sounds	Media Type located in Drawer is not supported	BAD SUPPLY MGZ	1–Alert

Summary

The RF TAG information indicates that the size of the media in the CARTRIDGE is incompatible with the IMAGER. Whenever a new CARTRIDGE is loaded or when power is turned on, the software reads the RF TAG on the bottom of the CARTRIDGE to identify the media type, size, etc.

Result of Error

The IMAGER is unable to print. It can still accept and queue print jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

This is an informational message only.

8-5-43. 21-175: ROLLBACK Failed to Engage CARTRIDGE

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Rollback Failed to Engage Cartridge– Alarm sounds	Rollback failed to engage cartridge	BAD SUPPLY MGZ	1–Alert

Summary

The ROLLBACK MOTOR DCM1 activated with the ROLLBACK HOME SENSOR S2 on, but S2 did not turn off. The most likely cause is a misinserted CARTRIDGE. The error is cleared when the FRONT DOOR is closed.

Result of Error

The IMAGER is unable to print. It can still accept and queue print jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

1. Open the FRONT DOOR.
2. Check the GEARS on the ROLLBACK MOTOR and the ROLLER.
3. Replace GEARS as necessary.
4. Using the KNOB to slowly rotate the ROLLER, observe engagement of the teeth with the LID of the CARTRIDGE.
5. If alignment is not correct, check that:
   a. The CARTRIDGE is inserted correctly.
   b. The LID of the CARTRIDGE is not bent or deformed.

8-5-44. 21-176: Supply CARTRIDGE Could Not Be Fully Opened

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Cartridge Failed to Open– Alarm sounds	Cartridge Open Sensor (S13) in Tray failed to activate in specified time	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER could not open the CARTRIDGE LID so that film could be picked up. The ROLLBACK ROLLER left the home position, as indicated by ROLLBACK HOME SENSOR S2, but did not reach the the open position, indicated by ROLLBACK COMPLETE SENSOR S13. The problem cold be a faulty S13, or possibly the operator inserted the FILM CARTRIDGE backward.

Result of Error

The IMAGER is unable to print. It is still able to accept and queue print jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

1. Check the Application Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. Use the SERVICE TOOL to check ROLLBACK COMPLETE SENSOR S13.

8-5-45. 21-177: Supply CARTRIDGE Could Not Be Closed

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Cartridge Failed to Close– Alarm sounds	Rollback Home Sensor (S2) in Drawer failed to activate in specified time	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER could not close the supply CARTRIDGE and is unable to print. This problem occurs when the rollback mechanism leaves the LID open position, as indicated by ROLLBACK COMPLETE SENSOR S13, but does not reach the home position, as indicated by ROLLBACK HOME SENSOR S2. The error is cleared when the FRONT DOOR is closed or power is cycled. A film jam or a defective SENSOR can cause this error.

Result of Error

The IMAGER is unable to print. It still can accept and queue print jobs.

User Action

1. Touch the [Play Video] button to view the error video.
2. Press the [Open Door] button and hold for 5 seconds to open the FRONT DOOR.
3. Clear any jammed film.
4. Close the CARTRIDGE manually. See note below.
5. Close the FRONT DOOR.
6. Run test prints to clear fogged film from the IMAGER.
7. If the error persists, use a new CARTRIDGE.

Caution

The user should not attempt to close the CARTRIDGE while this error state is in effect. If a jammed film is caught by the ROLLBACK as the CARTRIDGE is closed, it will damage the FILM GUARD.

FE Action

The problem is usually caused by a film pickup failure. If you cannot find loose film in Area 2:

1. Check the MCS Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. Use the SERVICE TOOL to check ROLLBACK HOME SENSOR S2 and ROLLBACK MOTOR DCM1.

8-5-46. 21-178: ROLLBACK Failed to Leave Home

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Cartridge Failed to Open– Alarm sounds	Rollback Home Sensor (S2) in Tray failed to deactivate in specified time	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER could not open the CARTRIDGE LID so that film could be picked up. The ROLLBACK ROLLER failed to leave the Home position, as indicated by ROLLBACK HOME SENSOR S2. The problem cold be a faulty S2 or ROLLBACK MOTOR DCM1, or possibly the operator inserted the FILM CARTRIDGE backward.

Result of Error

The IMAGER is unable to print. It is still able to accept and queue print jobs.

User Action

1. Try a new film CARTRIDGE.
2. If the error persists, call Service.

FE Action

1. Check the Application Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. Use the SERVICE TOOL to check ROLLBACK HOME SENSOR S2 and ROLLBACK MOTOR DCM1.

8-5-47. 21-179: ROLLBACK Failed to Move from Open Position

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Cartridge Failed to Close– Alarm sounds	Rollback Home Sensor (S2) in Tray failed to deactivate in specified time	BAD SUPPLY MGZ	1–Alert

Summary

The IMAGER could not close the CARTRIDGE LID. The ROLLBACK ROLLER failed to leave the full open position, as indicated by ROLLBACK COMPLETE SENSOR S13. The problem could be caused by a faulty S13 or ROLLBACK MOTOR DCM1, or by a film jam on the CARTRIDGE.

Result of Error

The IMAGER is unable to print. It is still able to accept and queue print jobs.

User Action

1. Touch the [Play Video] button to view the error video.
2. Press the [Open Door] button and hold for 5 seconds to open the FRONT DOOR.
3. Clear any jammed film.
4. Close the CARTRIDGE manually.
5. Close the FRONT DOOR.
6. Run test prints to clear fogged film from the IMAGER.
7. If the error persists, use a new CARTRIDGE.

FE Action

1. Check the Application Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. Use the ROLLBACK KNOB to check that the ROLLER moves freely.
3. Use the SERVICE TOOL to check ROLLBACK COMPLETE SENSOR S13 and ROLLBACK MOTOR DCM1.

8-5-48. 21-515: Calibration Print Failed

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibrate Failure– Alarm sounds	Calibration Failure, non–monotonic near Dmax	CALIBRATION ERR	0–Fatal

Summary

The calibration print failed. This error occurs during the process of building the film model, when wedge data fails one of the following detailed checks of monotonicity:

- The 3 step wedge values used to calculate the Dmax density are not monotonic, causing an error in the calibration calculations.
- Dmin is not monotonic. (The Dmin is measured at the last monotonic step. Some non-monotonic behavior is allowable around the Dmin, as long as it is not too far up the curve, pushing the last monotonic value above the allowable Dmin.)

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.).

- **User Action**

1. Restart the system.
2. If the problem persists, try a different film CARTRIDGE. The film may be defective.
3. If the problem still persists, call Service.

FE Action

1. First check for fogged or old film.
2. Then check the MCS Log for a Level 6 message. Look for the 26 density readings from the calibration film:

   Raw Wedge 0:1 3.3980
   1:2 3.3290
   etc.

3. Also check the GSM Log for a Level 6 message:

   StepWedge: wedge 0: 0.212523

If any of the density readings is negative, the DENSITOMETER is out of adjustment. (Refer to paragraph 3-5).

Other Possible Causes Of This Error

- Processor temperature requires adjustment
- Processor drum RTD requires adjustment (see Section 3 – Adjustments)

8-5-49. 21-624: Bad DENSITOMETER Data

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Film Density Readings not Monotonic– Alarm sounds	Drawer Calibration Failed. Densitometer readings not monotonic	CALIBRATION ERR	1–Alert

Summary

The DENSITOMETER data from a calibration print is not increasing monotonically or the DENSITOMETER did not find the precise number of steps in the calibration wedge. The most likely cause is fogged or old film. The error clears when a new calibration is requested or the FRONT DOOR is closed.

Result of Error

The IMAGER is unable to print, but it can accept and queue new print jobs.

User Action

1. Try a different film CARTRIDGE. The film may be defective.
2. If the problem persists, call Service.

Note

Manual mode is not usable with this error.

FE Action

1. First check for fogged film.
2. Check the expiration date on the film packaging.
3. Check the MCS Log.

8-5-50. 21-631: Dmin Not Met

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Film Dmin Outside Target– Alarm sounds	Drawer Calibration Failed. Dmin not met	CALIBRATION ERR	1–Alert

Summary

The Dmin requirement was not met on a calibration print. The error is detected when the Gray Scale Manager software receives the DENSITOMETER readings from a calibration sheet that has just been processed. An error is declared if the calibration sheet does not have a wedge with the required Dmin value. The most likely cause is fogged or old film. The error clears when another calibration is requested or when the FRONT DOOR ISis closed.

Result of Error

The IMAGER is unable to print, but can accept and queue new print jobs.

User Action

The operator should try a different FILM CARTRIDGE. If the problem recurs with the new CARTRIDGE, a service call should be placed. The operator can choose to run the SYSTEM in manual mode until service corrects the problem.

FE Action

The Field Engineer should check for defective film and check PROCESSOR temperature.

8-5-51. 21-632: Dmax Not Met

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Film Dmax Outside Target– Alarm sounds	Drawer Calibration Failed. Dmax not met	CALIBRATION ERR	1–Alert

Summary

The Dmax requirement was not met on a calibration print. The error is detected when the Gray Scale Manager software receives the DENSITOMETER readings from a calibration sheet that has just been processed. An error is declared if the calibration sheet does not have a wedge with the required Dmax value. The most likely cause is old film or too low PROCESSOR temperature.

Result of Error

The user can still acquire normally, but new print jobs will not be initiated unless the SYSTEM is set into manual mode (no AIQC).

User Action

The operator should try a different FILM CARTRIDGE. If the problem recurs with the new CARTRIDGE, a service call should be placed. The operator can choose to run the SYSTEM in manual mode until service corrects the problem.

FE Action

1. Check the GSM log for Step Wedge values. See the sample log of normal values below.

2. Check for defective film and check PROCESSOR temperature.

8-5-52. 21-921: FEEDER Diagnostics Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Feeder Diagnostics Failure– Alarm sounds	Feeder Board diagnostics failure	ELEC DOWN	0–Fatal

Summary

A component in the FEEDER MODULE has failed the power-up self-test. At power up, the FEEDER BOARD tests its circuits and all the MOTORS, SENSORS, and mechanics that compose the FILM FEED SYSTEM. If a test failure occurs after 3 tries,this error is declared. A problem with any of the FEEDER MODULE components will generate the same error code, 21–921.

Result of Error

The IMAGER is unable to print. Otherwise, it can operate as normal (queuing prints, completing processing, etc.).

User Action

The operator can try to clear the error by cycling power. However, the error will likely require a service call.

FE Action

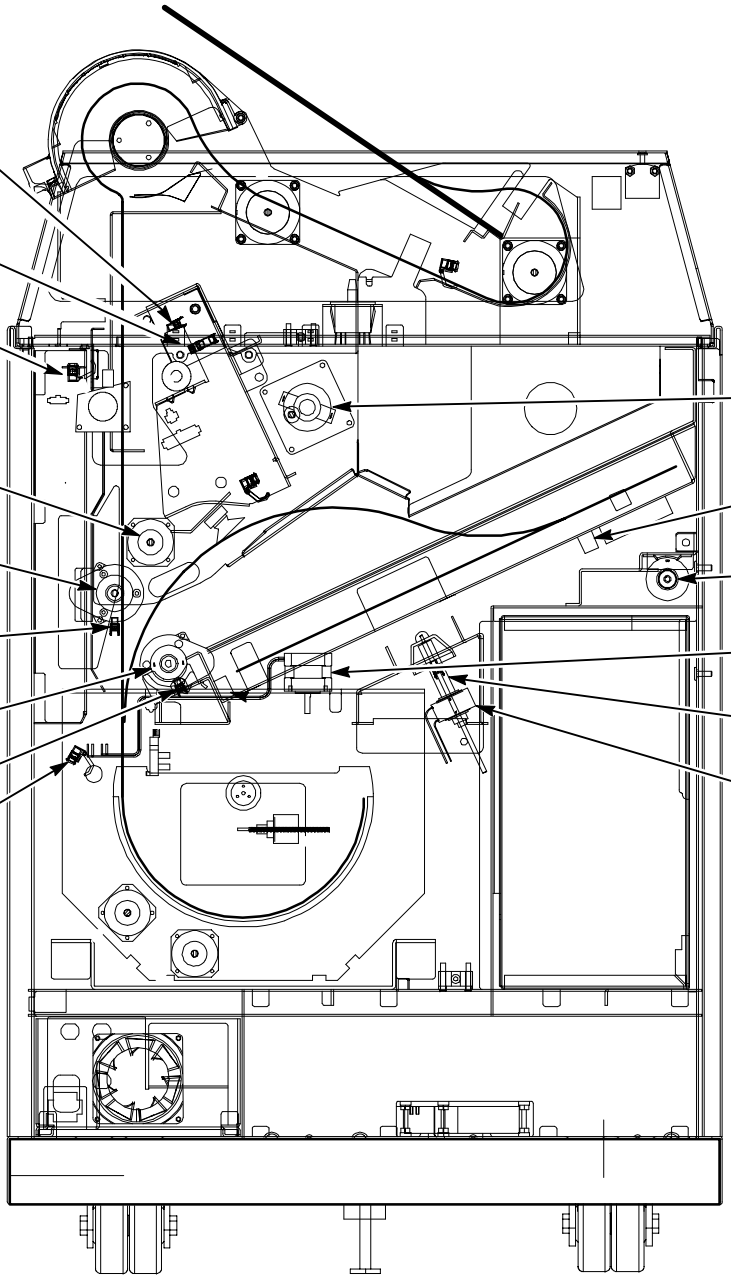
Suspect Components (in most likely order): SENSORS, CABLES, MOTORS, mechanical parts, FEEDER BOARD. See the drawing on the next page for locations of motors and sensors.

1. Check the MCS Log for the message “21–921 Printer Error.”
2. Use the power–on self–test troubleshooting procedure in paragraph 7-3 to attempt to isolate the error to a particular faulty component (SENSOR, MOTOR, CABLE, etc.). This procedure instructs you to cycle power and observe the power–on self–test process.

Note

The flow charts on the following pages (Figure 8-1, Sheets 1–3) show the complete sequence of SENSOR and MOTOR operations. The sequence of machine operations will halt, then restart when an error occurs, rather than proceeding to the next test. 21–921 is declared on the third cycle, but the test keeps on cycling after 21–921 is displayed. Check the last thing that occurred before 21–921.

3. Test suspected SENSORS as instructed in paragraph 7-4.
4. If the 21–921 error is generated, but the self-test MOTOR/SENSOR sequence does not even start (though the PICKUP ASSEMBLY may move slightly), the problem may be in the FEEDER BOARD or a CABLE. In this case proceed as follows:
   a. Check the RJ-45 connectors and the cabling between the MCS BOARD and FEEDER BOARD.
   b. Swap RJ-45 connectors on the MCS BOARD as follows:
      1) Power off.
      2) Swap the FEEDER BOARD RJ-45 with the RJ-45 for any other *MicroComm* peripheral.
      3) Power up and check whether the other *MicroComm* peripheral failed. If it did, the RJ-45 or cabling is bad.


Cups Engaged Sensor (S10)
Pickup Position Sensor (S3)
Vertical Transport Sensor (S8)
Feed Roller Motor (Step1)
Feed Roller Open Motor (DCM4)
Feed Roller Open Sensor (S11)
Rollback Motor (DCM1)
Rollback Home Sensor (S2)
Platen Film Sensor (S6)
Pickup Motor (DCM2)
Cartridge Presence Sensor (S1)
Film Surface Sensor (S4)
Film Out Sensor (S5) Behind)
Elevator Home Sensor (S12)
Elevator Motor (Step 8)

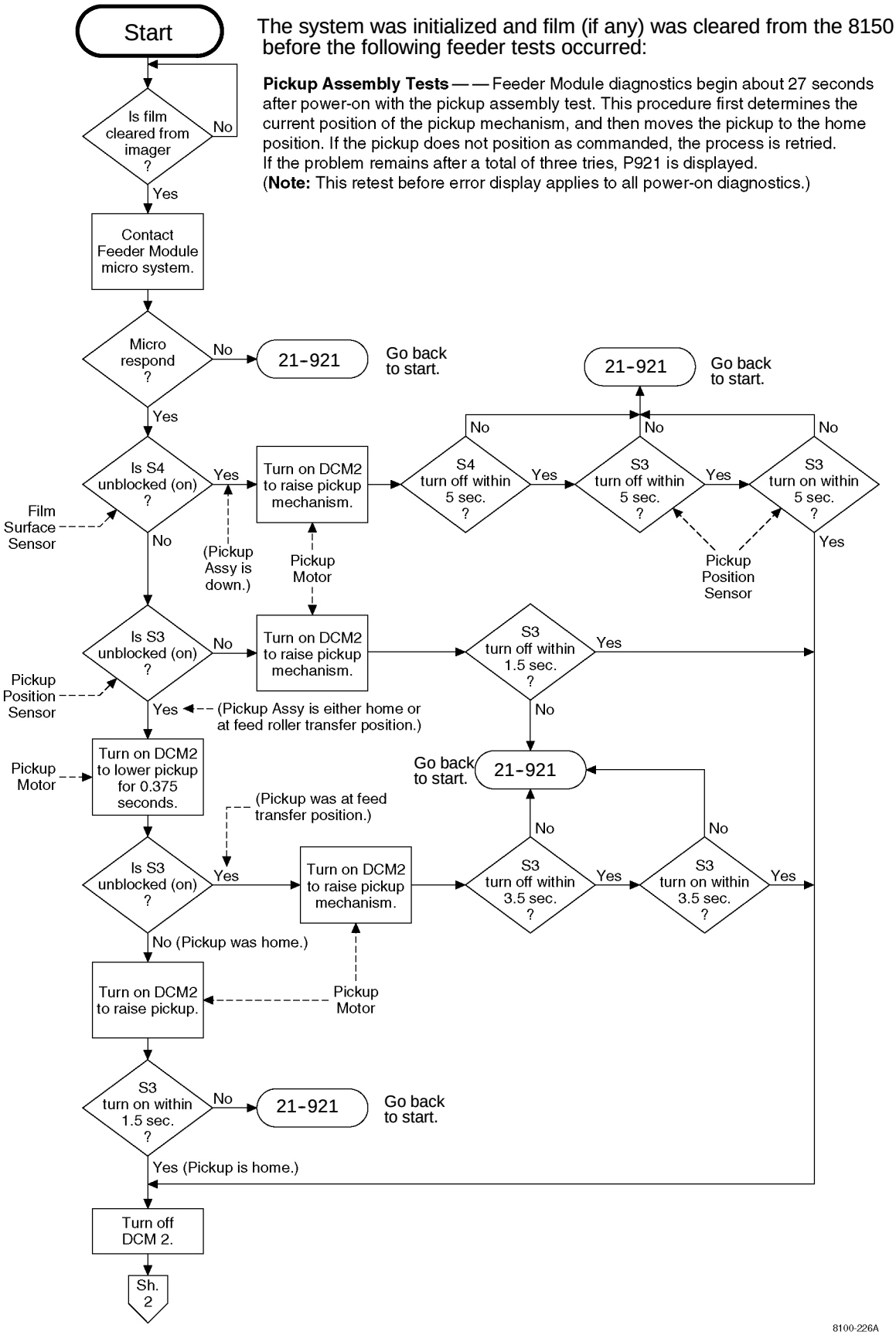

Start
The system was initialized and film (if any) was cleared from the 8150 before the following feeder tests occurred:
Pickup Assembly Tests — — Feeder Module diagnostics begin about 27 seconds after power-on with the pickup assembly test. This procedure first determines the current position of the pickup mechanism, and then moves the pickup to the home position. If the pickup does not position as commanded, the process is retried. If the problem remains after a total of three tries, P921 is displayed. (Note: This retest before error display applies to all power-on diagnostics.)
Is film cleared from imager ?
No
Yes
Contact Feeder Module micro system.
Micro respond ?
No
21-921
Go back to start.
Yes
Is S4 unblocked (on) ?
Yes
Turn on DCM2 to raise pickup mechanism.
S4 turn off within 5 sec. ?
Yes
S3 turn off within 5 sec. ?
Yes
S3 turn on within 5 sec. ?
Yes
No
Film Surface Sensor
(Pickup Assy is down.)
Pickup Motor
Pickup Position Sensor
Is S3 unblocked (on) ?
No
Turn on DCM2 to raise pickup mechanism.
S3 turn off within 1.5 sec. ?
Yes
Pickup Position Sensor
Yes
(Pickup Assy is either home or at feed roller transfer position.)
Turn on DCM2 to lower pickup for 0.375 seconds.
Pickup Motor
(Pickup was at feed transfer position.)
Is S3 unblocked (on) ?
Yes
Turn on DCM2 to raise pickup mechanism.
S3 turn off within 3.5 sec. ?
Yes
S3 turn on within 3.5 sec. ?
Yes
No (Pickup was home.)
Turn on DCM2 to raise pickup.
Pickup Motor
S3 turn on within 1.5 sec. ?
No
21-921
Go back to start.
Yes (Pickup is home.)
Turn off DCM 2.
Sh. 2
8100-226A

Figure 8-1. Film Feeder Module Diagnostics (Sheet 1)

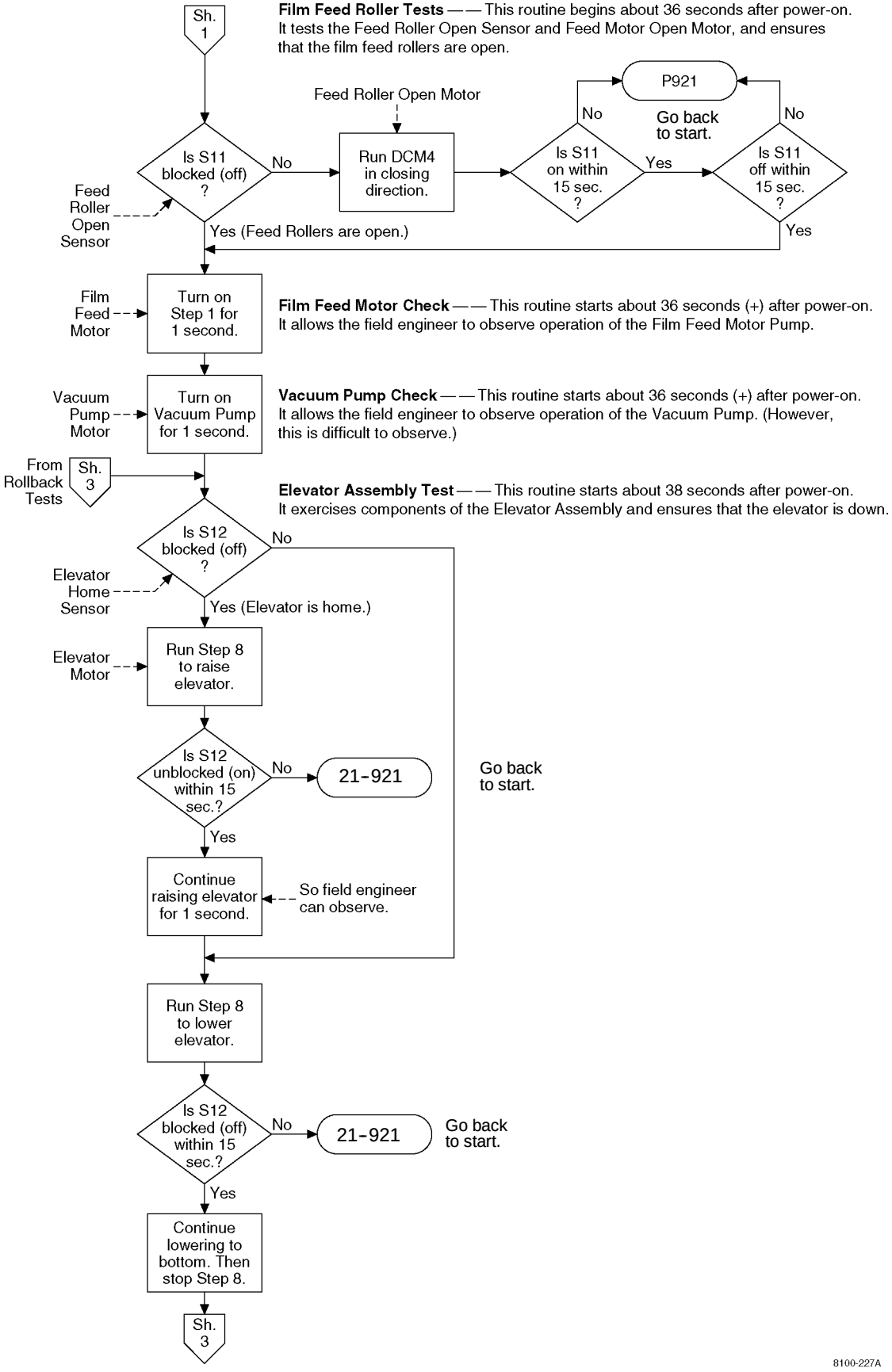

Sh. 1
Film Feed Roller Tests — — This routine begins about 36 seconds after power-on. It tests the Feed Roller Open Sensor and Feed Motor Open Motor, and ensures that the film feed rollers are open.
Feed Roller Open Motor
P921
Go back to start.
No
No
Is S11 blocked (off) ?
No
Run DCM4 in closing direction.
Is S11 on within 15 sec. ?
Yes
Is S11 off within 15 sec. ?
Yes
Feed Roller Open Sensor
Yes (Feed Rollers are open.)
Film Feed Motor
Turn on Step 1 for 1 second.
Film Feed Motor Check — — This routine starts about 36 seconds (+) after power-on. It allows the field engineer to observe operation of the Film Feed Motor Pump.
Vacuum Pump Motor
Turn on Vacuum Pump for 1 second.
Vacuum Pump Check — — This routine starts about 36 seconds (+) after power-on. It allows the field engineer to observe operation of the Vacuum Pump. (However, this is difficult to observe.)
From Rollback Tests
Sh. 3
Elevator Assembly Test — — This routine starts about 38 seconds after power-on. It exercises components of the Elevator Assembly and ensures that the elevator is down.
Is S12 blocked (off) ?
No
Elevator Home Sensor
Yes (Elevator is home.)
Elevator Motor
Run Step 8 to raise elevator.
Is S12 unblocked (on) within 15 sec.?
No
21-921
Go back to start.
Yes
Continue raising elevator for 1 second.
So field engineer can observe.
Run Step 8 to lower elevator.
Is S12 blocked (off) within 15 sec.?
No
21-921
Go back to start.
Yes
Continue lowering to bottom. Then stop Step 8.
Sh. 3
8100-227A

Figure 8-1. Film Feeder Module Diagnostics (Sheet 2)

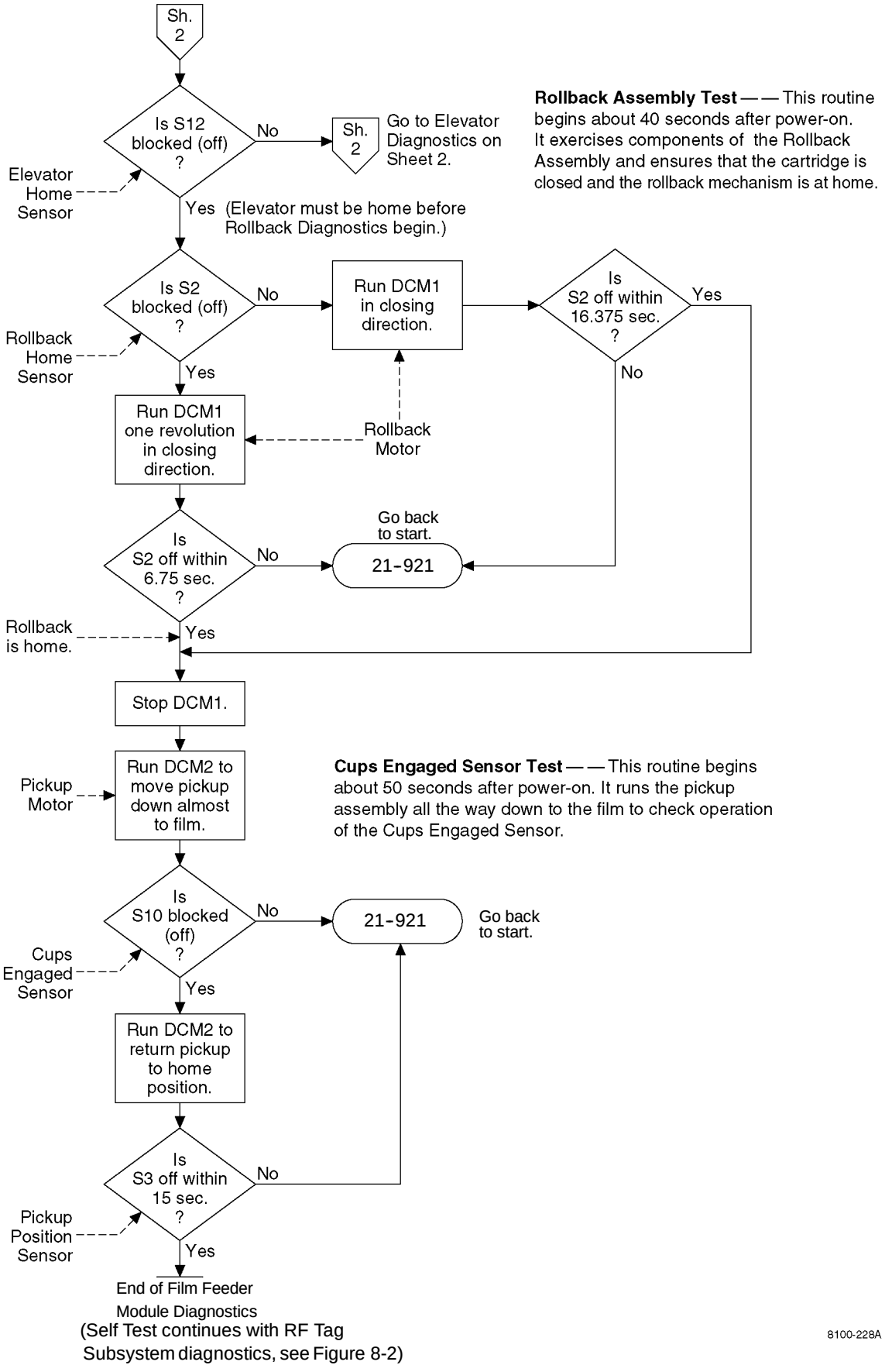

Sh. 2
Is S12 blocked (off) ?
No
Sh. 2
Go to Elevator Diagnostics on Sheet 2.
Elevator Home Sensor
Yes (Elevator must be home before Rollback Diagnostics begin.)
Rollback Assembly Test — — This routine begins about 40 seconds after power-on. It exercises components of the Rollback Assembly and ensures that the cartridge is closed and the rollback mechanism is at home.
Is S2 blocked (off) ?
No
Run DCM1 in closing direction.
Is S2 off within 16.375 sec. ?
Yes
No
Rollback Home Sensor
Yes
Run DCM1 one revolution in closing direction.
Rollback Motor
Go back to start.
Is S2 off within 6.75 sec. ?
No
21-921
Rollback is home.
Yes
Stop DCM1.
Pickup Motor
Run DCM2 to move pickup down almost to film.
Cups Engaged Sensor Test — — This routine begins about 50 seconds after power-on. It runs the pickup assembly all the way down to the film to check operation of the Cups Engaged Sensor.
Is S10 blocked (off) ?
No
21-921
Go back to start.
Cups Engaged Sensor
Yes
Run DCM2 to return pickup to home position.
Is S3 off within 15 sec. ?
No
Pickup Position Sensor
Yes
End of Film Feeder Module Diagnostics
(Self Test continues with RF Tag Subsystem diagnostics, see Figure 8-2)
8100-228A

Figure 8-1. Film Feeder Module Diagnostics (Sheet 3)

8-5-53. 25-922: RF TAG SUBSYSTEM Diagnostics Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Diagnostics Failure– RF Tag– Alarm sounds	RF Tag Reader failed self diagnostics	ELEC DOWN	0–Fatal

Summary

The RF TAG SUBSYSTEM failed its diagnostic self-test. At power up, the MICRO on the RF TAG INTERFACE BOARD is commanded to self-test the RF TAG SUBSYSTEM. If it fails the test after 3 tries, this error is declared. See the flow chart on the next page for test sequence details.

Result of Error

The IMAGER is unable to print. It can still accept and queue new jobs, but new films will not be initiated.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Check the MCS Log for the message “CARTRIDGE ID reader diag failed.”
2. Check the RJ-45 CONNECTORS and the cabling between the MCS BOARD and RF TAG INTERFACE BOARD.
3. Swap RJ-45 CONNECTORS on the MCS BOARD as follows:
   a. Power off.
   b. Swap the RJ-45 for the RF TAG INTERFACE BOARD with the RJ-45 CONNECTOR for any of the other *MicroComm* peripherals.
   c. Power up.
   d. Check whether the other *MicroComm* peripheral failed. If it did, the RJ-45 or cabling is bad.
4. If the RJ-45 CONNECTORS and cabling are OK, use the SERVICE TOOL to check out the RF TAG SUBSYSTEM as instructed in paragraph 7-2-5.

Note

Before the RF TAG self-test diagramed on the next page occurs after power-on, the following self-test functions have already taken place:
- The system has been initialized.
- Film (if any) has been cleared from the IMAGER.
- The FILM FEED SYSTEM has been tested (see 21–921 Quicksheet).

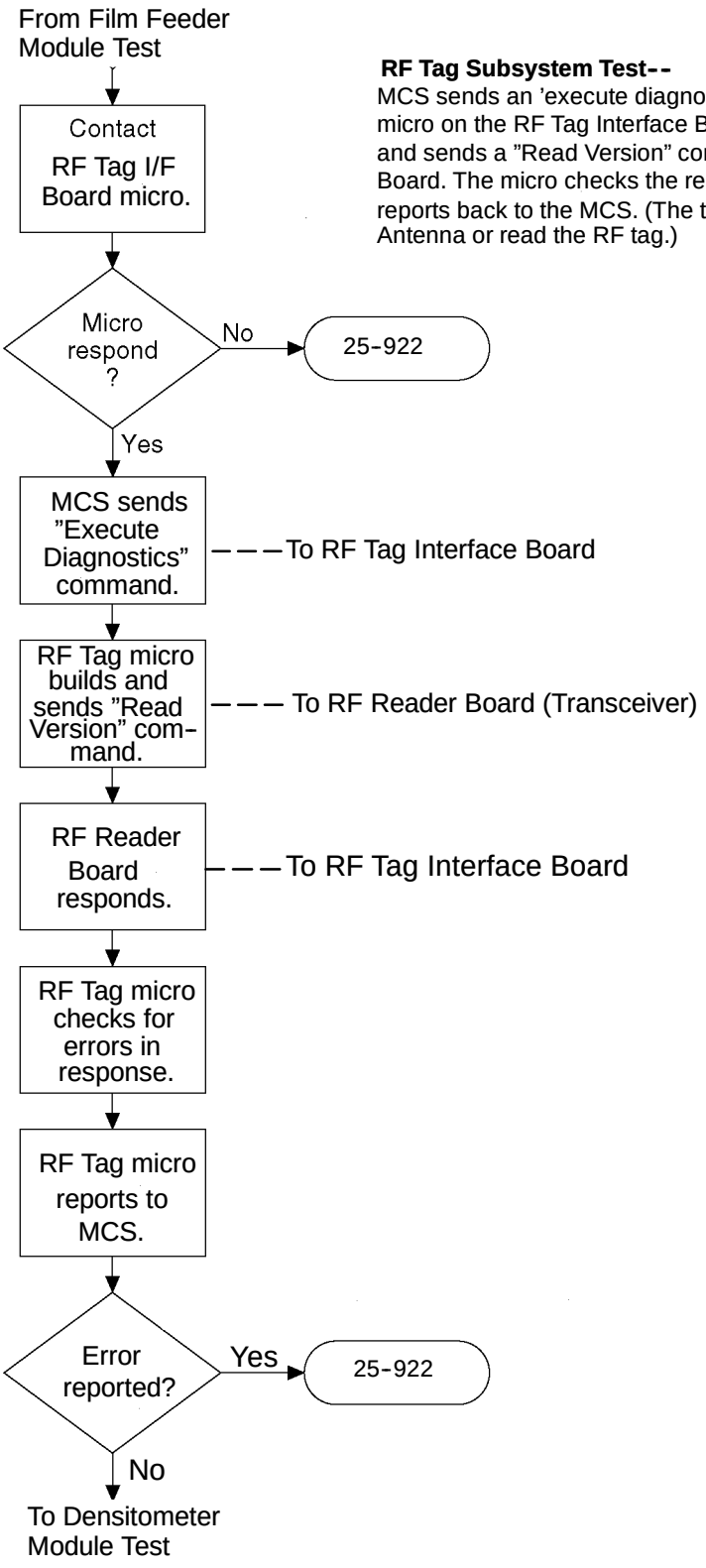

From Film Feeder Module Test
RF Tag Subsystem Test--
MCS sends an 'execute diagnostics" command to the micro on the RF Tag Interface Board, which in turn builds and sends a "Read Version" command to the RF Reader Board. The micro checks the response for errors and reports back to the MCS. (The test does not check the RF Antenna or read the RF tag.)
Contact RF Tag I/F Board micro.
Micro respond ?
No
25-922
Yes
MCS sends "Execute Diagnostics" command.
To RF Tag Interface Board
RF Tag micro builds and sends "Read Version" com-mand.
To RF Reader Board (Transceiver)
RF Reader Board responds.
To RF Tag Interface Board
RF Tag micro checks for errors in response.
RF Tag micro reports to MCS.
Error reported?
Yes
25-922
No
To Densitometer Module Test

Figure 8-2. RF TAG SUBSYSTEM Diagnostics

8-5-54. 25-931: RF TAG SUBSYSTEM Communications Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Communications Failure– RF Tag– Alarm sounds	MCS failed to communicate to RF Tag reader after 5 attempts	ELEC DOWN	0–Fatal

Summary

The RF TAG SUBSYSTEM passed its diagnostic self-test, but failed to respond to the MCS after 5 attempts.

Result of Error

The IMAGER is unable to print. It can still accept and queue new jobs, but new films will not be initiated.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

8-5-55. 25-932: RF TAG SUBSYSTEM Communications Retry

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	MCS failed to communicate with RF Tag	ELEC DOWN	0–Fatal

Summary

This notification to the LOG occurs when the MCS tries to communicate with the RF TAG SUBSYSTEM, but receives no response. After 5 unsuccessful attempts, error 25-931 is declared.

Result of Error

The system will function normally.

User Action

None

FE Action

None

8-5-56. 26-163: Jam Loading Exposure PLATEN

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 3: Platen–Alarm sounds	Film Jam Loading Exposure Platen: Film at Platen Sensor (S6) failed to detect film leading edge	FILM JAM	1–Alert

Summary

After film pickup, the leading edge of the film was not detected by PLATEN FILM SENSOR S6. Film is jammed between the between the FEED ROLLERS and the entrance to the PLATEN. The error indication is cleared by opening the FRONT DOOR, as indicated by

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but will not initiate a new print. Films downstream from the PLATEN will be completed. Any other films will be reprinted.

User Action

1. Open the FRONT DOOR.
2. Remove jammed film.
3. Close the FRONT DOOR.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the jam has been removed and the FRONT DOOR closed. However, the error could be generated by a problem with PLATEN FILM SENSOR S6, preventing the SENSOR from turning on as the film actuates the SENSOR FLAG.

Other Possible Causes Of This Error

- Vacuum release requires adjustment
- Film pickup assembly is bent
- Film pickup suction cup is sticking (see the procedure below)

Film Pickup Suction Cup Sticking

This problem occurred because the Suction Cup Plate (the metal to which the Suction Cups attach) was manufactured too long. When the Heel Pad was attached, the Shoulder Screws were too tight, causing the Suction Cup Plate to bend toward the Heel Pad. This caused a mechanical bind in this assembly.

Manufacturing fixed this problem starting with machine serial number 81501384 and Film Pickup Assembly serial number PUA01943.

If the serial number is below the above, check the Film Pickup Assembly whenever you are installing a new machine or a new part. You should also check the Film Pickup Assembly on your next call to make sure that your machine does not have this problem (see the following).

Problem: Film may not feed on top of the Feeder Roller or there is a loud noise when the Film Pickup is loading Film into the Feeder Assembly.

Cause: The Cup Plate Assembly does not rotate freely because the metal plate that holds the Cups is too long.

Solution: Manufacturing addressed this problem starting with Film Pickup Assembly serial number PUA01943. In the field, try the following:

1. Remove the Film Pickup Assembly from the machine.

2. Move the Motor away from the Gear Rack and extend the Film Pickup Assembly.

3. Check that the Cup Plate rotates freely and pivots on the Shoulder Screws. The small Roller should move up and down in the slot as you pivot the assembly.

Note: If the Cup Plate does rotate freely, stop here. This is not a problem on your machine. Refer to the Service Manual for additional troubleshooting.

4. If it does not rotate freely, loosen the Shoulder Screws on each side of the Heel Pad (do not remove the Screws) and check to see if it rotates freely now.

5. With the Shoulder Screws loose, if it rotates freely, bend the Heel Pad tabs (into which the Shoulder Screws are screwed) slightly outward on the Heel Pad Assembly. They should be just a little past 90 degrees. To bend the Heel Pad tabs, use a flat blade screwdriver between the tab and the Heel Pads.

6. Tighten the Shoulder Screws. When tightened properly, the Shoulder Screws should be next to the Cup Plate and the Washer on the inside should be next to the Heel Pad tab.

7. Check that the Cup Plate Assembly still rotates freely.

Problem: Film may not feed on top of the Feeder Roller.

Cause 1: The Vacuum Relase Valve is not adjusted properly.

Solution 1: Adjust the clearance on the Valve as outlined in the Service Manual. Clearance should be 0.030 to 0.070 in.

Cause 2: The alignment of the Film Pickup Assembly is not square. Make sure the large Rollers are not bent. They should move.

Solution 2: Reform the alignment.

8-5-57. 26-164: Jam Loading Exposure PLATEN

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 2: Platen–Alarm sounds	Film Jam Loading Exposure Platen: Platen Film Sensor (S6 failed to detect trailing edge	FILM JAM	1–Alert

Summary

Film is jammed at the entrance to the exposure area. When the film is picked up from the CARTRIDGE and placed in the FEED ROLLERS, it is driven to the PLATEN. When it enters the PLATEN, it turns on PLATEN FILM SENSOR S6, and the PLATEN FEED ROLLERS drive it down into the exposure position in the PLATEN. As the film drives to the exposure position, it exits SENSOR S6, and the SENSOR turns off, indicating to the SYSTEM software that the film is ready for exposure. If SENSOR S6 does not turn off within 5 seconds after turn-on, this jam error is declared. (5 seconds = 17 inches of film travel at 4 inches per second, plus tolerance.)

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.). Films downstream from the PLATEN will be completed. All other films will be reprinted. Removing the jam clears the error when the FRONT DOOR is closed.

User Action

1. Open the FRONT DOOR.
2. Remove jammed film.
3. Close the FRONT DOOR.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the jam has been removed and the FRONT DOOR closed. However, the error could be generated by hangup of the flag of PLATEN FILM SENSOR S6, preventing the SENSOR from turning off after the film passed through.

Check the MCS Log for 26-164 and trace backwards from the error looking for PLATEN FILM SENSOR S6 functionality.

8-5-58. 26-165: Jam at TRANSPORT

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 3: Transport– Alarm sounds	Film Jam Exiting Platen: Film at Platen Sensor (S6) failed to detect film trailing edge	FILM JAM	1–Alert

Summary

The film has jammed between the PLATEN and the PROCESSOR. As the film begins to drive out of the PLATEN, PLATEN SENSOR S6 turns on. As film drives up through the vertical transport area, VERTICAL TRANSPORT SENSOR S8 should detect the leading edge of the film and turn on. SENSOR S6 should turn off after S8 turns on, indicating that the film has passed out of the exposure area. If S8 does not turn on or S6 does not turn off as expected, a jam has occurred in the VERTICAL TRANSPORT.

Result or Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.). Films downstream from the PLATEN will be completed. All other films will be reprinted. Removing the jam clears the error when the FRONT DOOR is closed.

User Action

1. Open the FRONT DOOR.
2. Remove jammed film.
3. Close the FRONT DOOR.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the user removes the jam and closes the FRONT DOOR. However, the error can also be caused by problems with either VERTICAL TRANSPORT SENSOR S8 or PLATEN FILM SENSOR S6.

Check the MCS Log for 26–165 and trace backwards from the error looking for PLATEN FILM SENSOR S6 and S8 functionality.

8-5-59. Error 26-166: Film Jam at VERTICAL TRANSPORT

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 4: Transport– Alarm sounds	Film Jam at Vertical Transport: Film at Vertical Transport Sensor (S8) failed to detect film leading edge	FILM JAM	1–Alert

Summary

The film has jammed between the PLATEN and the PROCESSOR. When film drives up through the vertical transport area, VERTICAL TRANSPORT SENSOR S8 should detect the leading edge of the film and turn on. If S8 does not turn on as expected, a jam has occurred in the VERTICAL TRANSPORT.

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.). New print jobs will not be initiated. Films downstream from the VERTICAL TRANSPORT will be completed. All other films will be reprinted. Removing the jam clears the error when the FRONT DOOR is closed.

User Action

1. Open the FRONT DOOR.
2. Remove jammed film.
3. Close the FRONT DOOR.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the user removes the jam and closes the FRONT DOOR. However, the error can also be caused by problems with either VERTICAL TRANSPORT SENSOR S8 or TRANSPORT ROLLER MOTOR Step6.

Check the MCS Log for 26–166 and trace backwards from the error looking for VERTICAL TRANSPORT SENSOR S8 functionality.

8-5-60. 26-169: Jam Unloading Exposure PLATEN

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 3: Platen– Alarm sounds	Film Jam Unloading Platen: Platen Film Sensor (S6) failed to detect film leading edge	FILM JAM	1–Alert

Summary

Film has jammed exiting the exposure (PLATEN) area. As the PLATEN ROLLERS drive film out of the PLATEN after exposure, the film enters PLATEN SENSOR S6, and the SENSOR turns on, indicating to the SYSTEM software that the film is moving out of the PLATEN. If SENSOR S6 does not turn on within 2 seconds after the beginning of film drive, this jam error is declared.

Result of Error

The IMAGER is unable to print. Otherwise it can operate as normal (acquiring, queueing prints, completing processing, etc.). New print jobs will not be initiated. Films downstream from the PLATEN will be completed. All other films will be reprinted. Removing the jam clears the error when the FRONT DOOR is closed.

User Action

1. Open the FRONT DOOR.
2. Remove jammed film.
3. Close the FRONT DOOR.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the user removes the jam and closes the FRONT DOOR. However, the error can also be caused by problems with PLATEN ROLLER MOTOR Step2 or PLATEN FILM SENSOR S6.

Check the MCS Log for 26-169 and check PLATEN FILM SENSOR S6. Make sure that the SWITCH turns ON and OFF.

8-5-61. 26-542: Jam at PROCESSOR

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 4: Processor– Alarm sounds	Film Jam in Processor: Vertical Transport Sensor (S8) failed to detect film trailing edge	FILM JAM	1–Alert

Summary

The film is jammed on the PROCESSOR DRUM. After exposure, the film is driven from the PLATEN by the PLATEN ROLLER MOTOR through PLATEN FILM SENSOR S6, continuing up through the VERTICAL TRANSPORT area. At the top of the VERTICAL TRANSPORT area, the film passes through VERTICAL TRANSPORT SENSOR S8, turning it on. If the SENSOR does not turn off within 46 seconds, indicating that the film has passed entirely through the SENSOR, 26-542 is declared.

The PROCESSOR stops rotating and turns off heat when the error occurs. All films in the IMAGER are marked as bad and will have to be reprinted. After the jammed film is removed and the TOP HOOD is closed, the error is reset and the PROCESSOR is restarted. The PROCESSOR may need to warm up before printing will continue.

Result of Error

The IMAGER is unable to print. It can still accept and queue new jobs. But new print jobs will not be initiated. Removing the jam clears the error when the TOP HOOD is closed.

User Action

Warning

The PROCESSOR is hot!

1. Open the TOP HOOD.
2. Open the PROCESSOR COVER.
3. Remove jammed film.
4. Close the PROCESSOR COVER and TOP HOOD.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the jam has been removed and the TOP HOOD closed. However, the error could be generated by a defective VERTICAL TRANSPORT SENSOR S8.

8-5-62. 26-543: Jam Prior to DENSITOMETER

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 5: Processor– Alarm sounds	Film Jam Prior to Densitometer: Densitometer/Exit Sensor (S9) failed to detect film leading edge	FILM JAM	1–Alert

Summary

The film is jammed between the PROCESSOR DRUM and the DENSITOMETER. The developed film is driven by TRANSPORT ROLLERS from the DRUM to the DENSITOMETER. As it enters the DENSITOMETER it contacts the ACTUATOR of DENSITOMETER/EXIT SENSOR S9, turning the SENSOR on. If S9 does not turn on within 22.5 to 35 seconds (depending on the length of the film) after VERTICAL TRANSPORT SENSOR S8 turned off, error 26–543 is declared.

The PROCESSOR stops rotating and turns off heat when the error occurs. All films in the IMAGER are marked as bad and will have to be reprinted. After the jammed film is removed and the TOP HOOD is closed, the error is reset and the PROCESSOR is restarted. The PROCESSOR may need to warm up before printing will continue.

Result of Error

The IMAGER is unable to print. It can still accept and queue new jobs. But new print jobs will not be initiated. Removing the jam clears the error when the TOP HOOD is closed. Films will be cleared automatically at this point.

User Action

Warning

The PROCESSOR is hot!

1. Open the TOP HOOD.
2. Open the PROCESSOR COVER.
3. Remove jammed film.
4. Close the PROCESSOR COVER and TOP HOOD.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the jam has been removed and the TOP HOOD closed. However, the error could be generated by a defective DENSITOMETER/ EXIT SENSOR S9.

Other Possible Causes Of This Error

- Felt pad assembly requires adjustment

8-5-63. 26-544: Jam at DENSITOMETER

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Film Jam in Area 5:– Alarm sounds	Film Jam at Densitometer: Densitometer/Exit Sensor (S9) failed to detect film trailing edge	FILM JAM	1–Alert

Summary

The film is jammed between the DENSITOMETER and the EXIT TRAY. The developed film from the DRUM turns on PROCESSOR/EXIT SENSOR S9 as it enters the DENSITOMETER. If SENSOR S9 does not turn off within 5 seconds, indicating that the film has passed through the SENSOR, error 26-544 is declared. This error signals that the film has jammed in the DENSITOMETER before reaching the EXIT TRAY.

The PROCESSOR stops rotating and turns off heat when the error occurs. All films in the IMAGER are marked as bad and will have to be reprinted. After the jammed film is removed and the TOP HOOD is closed, the error is reset and the PROCESSOR is restarted. The PROCESSOR may need to warm up before printing will continue.

Result of Error

The IMAGER is unable to print. It can still accept and queue new jobs. But new print jobs will not be initiated. Removing the jam clears the error when the TOP HOOD is closed. Films will be cleared automatically at this point.

User Action

1. Open the TOP HOOD.
2. Open the PROCESSOR COVER.
3. Remove jammed film.
4. Close the PROCESSOR COVER and TOP HOOD.

FE Action

Normally this message simply indicates that a jam has occurred, and the error will be cleared when the jam has been removed and the TOP HOOD closed. However, the error could be generated by hangup of the flag of DENSITOMETER/ EXIT SENSOR S9.

8-5-64. Error 27-121: ATTENUATOR Error

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure:– Alarm sounds	Attenuator Home Sensor failed to detect Attenuator Motor movement	ELEC DOWN	0–Fatal

Summary

The IMAGER was unable to move the ATTENUATOR to the requested position after multiple attempts. The OPTICS ATTENUATOR MOTOR (Step 3), under control of the MCS BOARD, is stepped to set the ATTENUATOR at the position that will provide the desired image density. The MOTOR can step the ATTENUATOR to 650 different positions, from home (zero) to 650.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Check the MCS Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. The components involved are the OPTICS ATTENUATOR MOTOR and the ATTENUATOR SENSOR. Since these parts are in the SCANNER MODULE, the complete SCANNER MODULE must be replaced.

8-5-65. 27-123: SPINNER Error

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure:– Alarm sounds	Spinner fails to rotate at desired speed	ELEC DOWN	0–Fatal

Summary

The OPTICS MODULE SPINNER is not rotating, or is not rotating consistently at the correct speed. The SPINNER MOTOR scans the laser across the film, as the beam is reflected successively from the two MIRROR facets in the double scan process. Turn on and speed of the MOTOR are controlled by the SLAVE MICRO on the OPTICS MODULE CONTROL BOARD. (Refer to sheet 2 of the SYSTEM functional diagrams.) The speed control signal (SERIAL CLK) from the SLAVE MICRO is fed to a DAC. The analog output of the DAC is amplified and used as a drive signal for the SPINNER MOTOR. During each revolution of the SCANNER, a PHOTODETECTOR (SHAFT INDEX SENSOR) is activated by the laser beam reflecting off a shiny area on the ADAPTER that secures the MIRROR to the SHAFT of the SPINNER MOTOR. The resultant signal is used to track speed of the SPINNER MOTOR. If the speed of the MOTOR goes out of spec, 27-123 is declared.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. The SPINNER MOTOR should be rotating if a print has been requested in the last half hour. Listen for the sound of the MOTOR. If the MOTOR is not spinning, the SCANNER MODULE will have to be replaced. If it is spinning, assume that the speed of rotation is out of spec.
2. The problem may be a noisy or out of spec +5 VDC SUPPLY (possibly affecting operation of the SHAFT INDEX SENSOR). For consistent monitoring of SPINNER speed, the supply voltage must not be lower than 4.9 VDC, as measured on the MCS BOARD. (Use the VCC1 test point, with ground at GND1.)
3. If the DC SUPPLY is OK, suspect one of the following components: SHAFT INDEX SENSOR, OPTICS SPINNER MOTOR, or OPTICS MODULE CONTROL BOARD. Since all these components are contained within the SCANNER MODULE, if one of them fails, the SCANNER MODULE must be replaced.

Note

If the SCANNER is not used for 30 minutes, the SPINNER MOTOR is turned off. Low volume sites have had some problems with the motor “sticking” because of infrequent use. If this occurs, the SCANNER MODULE must be replaced.

8-5-66. 27-602: Invalid POWER MONITOR Range with ATTENUATOR Open

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Optics:– Alarm sounds	Optics calibration failed. Power Monitor value with Atten open outside valid range.	ELEC DOWN	0–Fatal

Summary

Optics calibration and diagnostics detected that a POWER MONITOR reading with the ATTENUATOR wide open was outside the predefined valid range. The measured laser power is either too high or too low. Optics calibration and diagnostics are performed at power up and before every calibration print. During this process the ATTENUATOR is calibrated and laser power is checked and calibrated. At the beginning of the sequence, the POWER MONITOR offset value is measured, and then the range of the POWER MONITOR is checked with the ATTENUATOR wide open (no attenuation). (POWER MONITOR offset is subtracted from this value.) If the range value is outside set limits, error 27-602 is declared.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by requesting another calibration or by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

This error can be the result of any of the following problems (listed in most likely order of occurrence):

- Open or failed interlock (or SERVICE OVERRIDE SWITCH set in Service position)
- Failed OPTICS MODULE
- Loss of ±12 vdc power
- Failed MCS BOARD (controls OPTICS MODULE circuits)
- Miswired or damaged SERVICE SWITCH (This problem is rare but can occur in the field if a SWITCH is replaced. Suspect it if the error occurs immediately after replacing the SERVICE SWITCH.)

1. Check the MCS and GSM logs for indications of the error.
2. The acceptable range for the “powerMonitorAttenopen” value is 2492 to 3950. A value outside this range will generate 27–602.
   a. If the value is grossly outside the acceptable range, suspect an INTERLOCK problem. To confirm this, check the MCS log for indications of “Door open without CARTRIDGE closed.”
   b. If the value is barely outside the range, suspect the OPTICS MODULE. (Examples of problems that have resulted in this error are: COLLIMATOR LENS adhesive failure and L2 LENS failure.) Check the Optics Laser Adjustment, Procedure 3-7.
3. POWER SUPPLY problems can also cause a failure. Check for ±12 vdc on the pads on the left center of the MCS BOARD (just above the VCC1 test points). For ground, use GND1.

Caution

Do not attempt to take measurements directly on the J23 CONNECTOR pins on the MCS BOARD. Shorting the pins can cause extensive damage in the IMAGER.

The control circuits for the OPTICS ATTENUATOR MOTOR and the SPINNER MOTOR require ±12 vdc. Also, the driver circuit for the laser requires “Laser ±12” vdc, which is routed through RELAY K2 on the MCS BOARD when the SERVICE OVERRIDE SWITCH is in the user position. Thus, loss of ±12 volt power, either by failure of the DC POWER SUPPLY or as a result of an open or failed INTERLOCK, will deactivate the OPTICS MODULE.

8-5-67. 27-603: Invalid ATTENUATOR Optical Density Range

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Optics:– Alarm sounds	Optics calibration failed. Attenuator Optical Density value outside valid range.	ELEC DOWN	0–Fatal

Summary

Optics calibration and diagnostics detected that the calculated ATTENUATOR optical density range was outside the predefined valid range. Optics calibration and diagnostics are performed at power up and before every calibration print. During this process the ATTENUATOR is calibrated and laser power is checked and calibrated. At the beginning of the sequence, POWER MONITOR offset is measured and BEAM POWER MONITOR range is checked. Then the ATTENUATOR is calibrated. After this, a range of density is checked as a function of ATTENUATOR setting. If this range is out of specification, error 27-603 is declared.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by requesting another calibration or by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

This error can be the result of any of the following problems (listed in most likely order of occurrence):

- Open or failed INTERLOCK (or SERVICE OVERRIDE SWITCH set in Service position)
- Failed OPTICS MODULE
- Loss of ±12 vdc power
- *Failed MCS BOARD (controls OPTICS MODULE circuits)*

1. Check the MCS and GSM logs for indications of the error. Sample logs are shown on the next page. The ATTENUATOR optical density range must be from 0 to at least 1.0. Thus, as shown In the sample logs, the last (21st) value in the range must be at least 1.0. (Also, it cannot be higher than 1.3.)
2. Check the MCS log for indications of “Door open without CARTRIDGE closed.” (Possible INTERLOCK problem.)
3. POWER SUPPLY problems can also cause a failure. Check for ±12 vdc on the pads on the left center of the MCS BOARD (just above the VCC1 test points). For ground, use GND1.

Caution

Do not attempt to take the measurements directly on the CONNECTOR pins. Shorting the pins can cause extensive damage in the IMAGER.

The control circuits for the OPTICS ATTENUATOR MOTOR and the SPINNER MOTOR require ±12 vdc. Also, the driver circuit for the laser requires “Laser ±12” vdc, which is routed through RELAY K2 on the MCS BOARD when the SERVICE OVERRIDE SWITCH is in the user position. Thus, loss of

±12 volt power, either by failure of the DC POWER SUPPLY or as a result of an open or failed INTERLOCK will deactivate the optics.

8-5-68. 27-604: Invalid Laser Dynamic Range

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Optics:– Alarm sounds	Optics calibration failed to Adjust Laser Dynamic Range within limits	ELEC DOWN	0–Fatal

Summary

Optics calibration and diagnostics detected that the calculated laser dynamic range was outside the predefined valid range. Optics calibration and diagnostics are performed at power up and before every calibration print. During this process the ATTENUATOR is calibrated and laser power is checked and calibrated. During laser checks, the laser dynamic range is tested. Dynamic range is defined as the ratio of the POWER MONITOR reading at maximum laser power to the reading at minimum laser power. If this ratio is outside the set limit, error 27-604 is declared.

Note

This error can occur after the MCS BOARD or SCANNER MODULE has been replaced and the laser dynamic range adjustment is not performed. The adjustment uses software to “tune” an offset value in an EE-POT on the MCS BOARD. This in effect “matches” the MCS BOARD to the optics.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by requesting another calibration or by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

This error can be the result of any of the following problems (listed in most likely order of occurrence):

- Open or failed INTERLOCK (or SERVICE OVERRIDE SWITCH set in Service position at power on))
- Mismatched Optics and MCS BOARD (laser dynamic range adjustment needed)
- Failed OPTICS MODULE
- Loss of ±12 vdc power

Check the MCS and GSM logs for indications of the error. Sample error logs are shown on the next page. The laser dynamic range value must be between 140 and 160.

a. If the dynamic range value is 1.0 (or close to 1.0), suspect an open interlock or that the Service Switch was in User position at power on.

b. If the dynamic range value is way off, perform the laser dynamic range adjustment, paragraph 3-6.

3. Note the following precautions about the laser dynamic range adjustment:
   - Make sure the SERVICE SWITCH is set to normal (User) position before the adjustment.
   - Cycle power and allow the IMAGER to warm up fully before performing the adjustment.
   - You may have to perform the adjustment 2 or 3 times before it succeeds.

Too many SCANNER MODULES are being replaced unnecessarily in the field. DO NOT replace the SCANNER MODULE if P604 appears **after** you replaced the MCS BOARD or SCANNER MODULE (that is, if the error code did not originally cause the replacement of the assembly). Perform the dynamic range adjustment (paragraph 3-6).

8-5-69. 27-605: POWER MONITOR is Saturated

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Optics:– Alarm sounds	Optics calibration detected Power Monitor saturation	ELEC DOWN	0–Fatal

Summary

The POWER MONITOR is saturated with the laser set at maximum power. Optics calibration and diagnostics are performed at power up and before every calibration print. During this process the ATTENUATOR is calibrated and laser power is checked and calibrated. During laser diagnostics, maximum laser power is applied with the ATTENUATOR at a minimum setting. If the BEAM POWER MONITOR is saturated, the ATTENUATOR is adjusted to add density and lower the POWER MONITOR reading. If after adjustment, the POWER MONITOR reading is still too high, a 27–605 error is declared. The problem is probably with the ATTENUATOR in the OPTICS MODULE.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by requesting another calibration or by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Check the MCS log for indications of “Door open without CARTRIDGE closed.” (This could indicate an interlock problem.)
2. If there appears to be no INTERLOCK problems, replace the SCANNER MODULE.

8-5-70. 27-606: ATTENUATOR Calibration Failed

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Calibration Failed: Optics:– Alarm sounds	Optics Calibration Failed: Power Monitor readings not monotonic	ELEC DOWN	0–Fatal

Summary

ATTENUATOR calibration failed during optics calibration and diagnostics. The POWER MONITOR readings were not monotonic. Optics calibration and diagnostics are performed at power up and before every calibration print. During this process the ATTENUATOR is calibrated and laser power is checked and calibrated. At the beginning of the sequence, POWER MONITOR offset is measured and beam POWER MONITOR range is checked. Then the ATTENUATOR is calibrated. Calibration consists of measuring ATTENUATOR optical density using POWER MONITOR readings taken at 21 different ATTENUATOR settings. This should create a smooth, monotonic curve of ATTENUATOR setting vs. optical density. If spikes occur on the curve, error 27-606 is declared. This may indicate scratches or dirt in the optics.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by requesting another calibration or by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

Clean the optics (see paragraph 5-5). If this does not fix the problem, replace the SCANNER MODULE.

8-5-71. 27-640: Optics Translation Home Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Hardware Failure:– Alarm sounds	Optics Home Sensor (S7) failed to detect Optics Module	ELEC DOWN	0–Fatal

Summary

The SCANNER did not return to the home position after a scan operation. The SYSTEM returns the SCANNER to its home position after every scan operation by activating the OPTICS TRANSLATION MOTOR. When it reaches the home position, OPTICS HOME SENSOR S7 is blocked and turns off, indicating to the MASTER CPU on the MCS BOARD that the SCANNER is home. If SENSOR S7 does not go low, the error is declared. Possible causes of the error include a DRE boot failure, a defective SENSOR S7, or a defective OPTICS TRANSLATION MOTOR. Another possible cause is interference from CABLES or other objects which prevents the OPTICS MODULE from reaching the home position properly.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Check the MCS Log to try to determine the point at which the error occurred. (This may help isolate the problem.)
2. Use the SERVICE TOOL (paragraph 7-2-8) or LED2 on the MCS BOARD (paragraph 7-4-1-3) to check the OPTICS HOME SENSOR S7.
3. Use SERVICE TOOL (paragraph 7-2-6) to check operation of the OPTICS TRANSLATION MOTOR.
4. Check the PLATEN ASSEMBLY for possible obstructions to optics translation motion.

Other Possible Causes Of This Error

- Optics translation home sensor actuator bent

8-5-72. 27-641: Optics NVRAM Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Optics NVRAM Fail:– Alarm sounds	Optics NVRAM	ELEC DOWN	0–Fatal

Summary

The OPTICS MODULE setup parameters cannot be read from NVRAM. At power on, the SYSTEM attempts to read the OPTICS MODULE setup parameters from the NVRAM (eePROM) on the OPTICS MODULE CONTROL BOARD. If it fails after 5 tries, 27-641 is declared and the system stops.

Result of Error

The IMAGER will not operate.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Check the MCS Log to try to determine the point at which the error occurred.
2. Check that the *MicroComm* CABLE to the OPTICS MODULE is securely connected.
3. Reload parameters using local scripts (see the procedure below).

Reloading Parameters Using Local Scripts

At times, the Optic parameters will go to zero. When this occurs, error 27–641 will display on the Local Panel. If this occurs, do the following:

1. Access the Service Tool/Diagnostics/Scripts.
2. Click the REMOTE tab.
3. Locate and click on SetFacettoStretch2.vbs
4. Click RUN.
5. Click on the Script RunTime tab and wait for PASS to be displayed.
6. Click on Edit/Run Script.
7. Follow steps 2 thru 6 for the following scripts:
   a. SetPixelStretch2.vbs
   b. SetSOSDelay2.vbs
8. Click on Diagnostics/MCS/Optics/Display Optics Data.
9. Click RUN.
10. The Optics NVRAM values should no longer be zero. Note, the values established at this point are default values that may not provide a good image for your machine. If the image is not acceptable, continue with step 11.
11. Print an internal SMPTE.

12. Examine the Horizontal bars with an eye loop and look for jagged edges. If the edges are jagged, you will need to change the Pixel Stretch parameter using the SetPixelStretch2.vbs script.

13. Examine the position of the top of the image. If the image is too far down or too far up, the SOS Delay parameter will have to be changed using the SetSOSDelay2.vbs script.

14. If steps 10 and 11 look good, but the overall image does not look good, the SetFacetToStretch2.vbs script value should be changed. This will either be a 1 or 0.

15. If steps 12, 13, or 14 need to be changed, do the following:

    a. Access the Service Tool/Diagnostics/Scripts.

    b. Click on the Local tab.

    c. Locate the correct script on your laptop and click OPEN.

    d. In the script screen, change the value. It is usually the last line.

    e. Click on RUN.

    f. Click on the Script RunTime tab and wait for PASS to be displayed.

16. Print an internal SMPTE and check the image.

8-5-73. 27-923: Optics Diagnostics Failed

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Optics Diagnostics Failed:– Alarm sounds	Optics Calibration Failed: Power up diagnostics failed	ELEC DOWN	0–Fatal

Summary

The OPTICS BOARD failed its power-up self-test. At power up, the OPTICS BOARD is commanded to self-test. If it fails the test after 3 tries, this error is declared. See the flow chart on the next page for the test sequence.

Result of Error

The IMAGER will not operate.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Is the *MicroComm* CABLE from the MCS BOARD to the OPTICS MODULE seated properly?
2. Is the flat CABLE in the EXPOSURE ASSEMBLY seated properly? Check that the CONNECTOR STANDOFFS are not too long, preventing solid connection.

Note

As shown in the flow chart on the next page, this error can be caused only by failure of the *MicroComm* CABLE from the MCS BOARD to the optics or by a component internal to the OPTICS MODULE (the ATTENUATOR MOTOR, the ATTENUATOR HOME SENSOR or electronics on the OPTICS MODULE CONTROL BOARD). To fix the problem either the optics CABLE or SCANNER MODULE must be replaced.

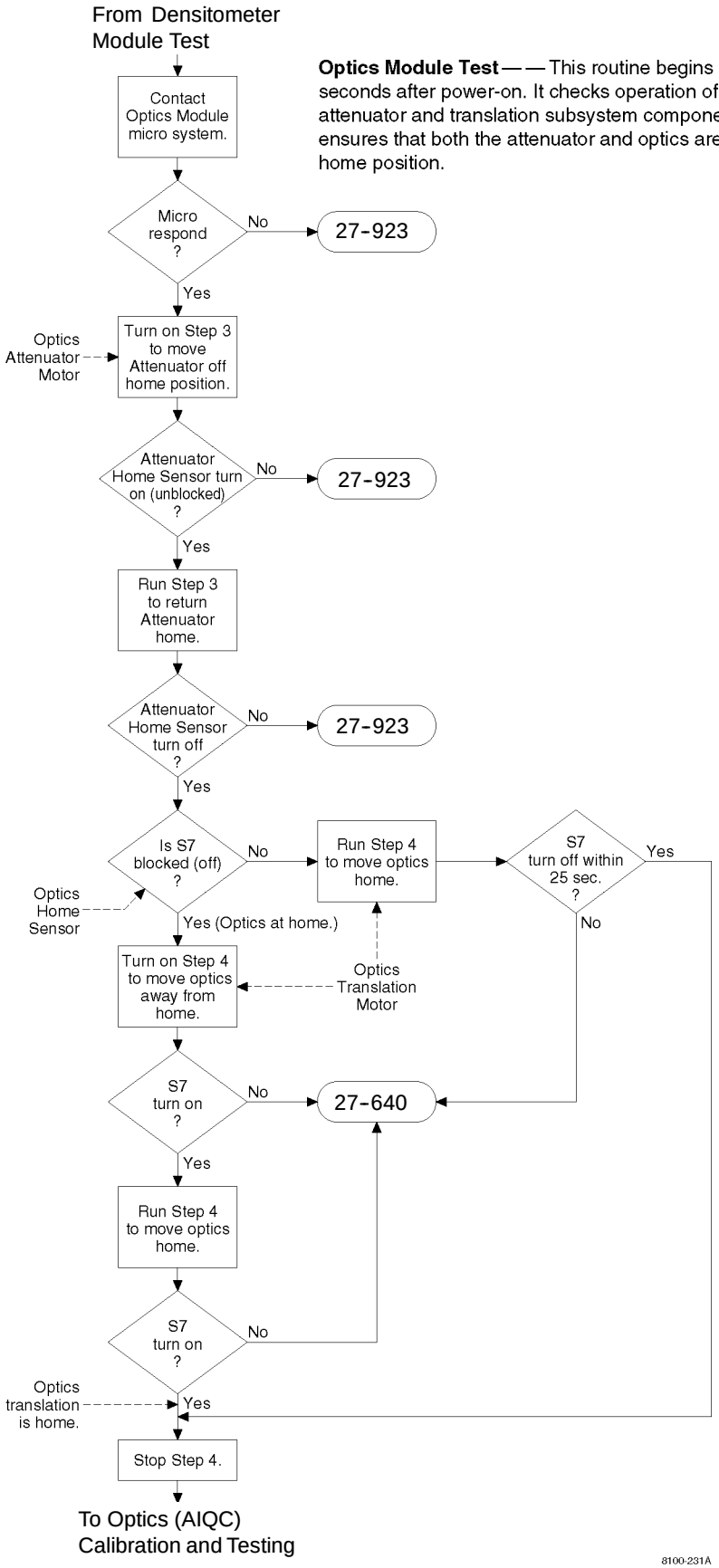

From Densitometer Module Test
Optics Module Test — — This routine begins about 66 seconds after power-on. It checks operation of the optics attenuator and translation subsystem components and ensures that both the attenuator and optics are in the home position.
Contact Optics Module micro system.
Micro respond ?
No
27-923
Yes
Optics Attenuator Motor
Turn on Step 3 to move Attenuator off home position.
Attenuator Home Sensor turn on (unblocked) ?
No
27-923
Yes
Run Step 3 to return Attenuator home.
Attenuator Home Sensor turn off ?
No
27-923
Yes
Is S7 blocked (off) ?
No
Run Step 4 to move optics home.
S7 turn off within 25 sec. ?
Yes
No
Optics Home Sensor
Yes (Optics at home.)
Turn on Step 4 to move optics away from home.
Optics Translation Motor
S7 turn on ?
No
27-640
Yes
Run Step 4 to move optics home.
S7 turn on ?
No
Optics translation is home.
Yes
Stop Step 4.
To Optics (AIQC) Calibration and Testing
8100-231A

Figure 8-3. OPTICS MODULE Diagnostics

8-5-74. 27-931: Optics Communications Failed

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Communications Failure: Optics– Alarm sounds	MCS failed to communicate with Optics Module after 5 attempts	ELEC DOWN	0–Fatal

Summary

The MCS tried to communicate with the OPTICS MICRO, but received no response after 5 attempts.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. Films downstream from the PLATEN will be completed. All other films will be reprinted. The error can be cleared by only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

This error can be caused only by failure of the *MicroComm* CABLE from the MCS BOARD to the optics or by the OPTICS CONTROL BOARD.

1. Is the *MicroComm* CABLE from the MCS BOARD to the OPTICS MODULE seated properly?

8-5-75. 27-932: Optics Communications Retry

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	MCS failed to communicate with Optics	NORMAL	3–Notify

Summary

This notification to the Log occurs when the MCS tries to communicate with the OPTICS MICRO, but receives no response. If the failure occurs 5 times in succession, error 27-931 is declared.

Result of Error

None. The IMAGER will function normally.

User Action

None

FE Action

None

8-5-76. 28-506: MCS Cannot Read PROCESSOR Temperature

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Communication Failure: Processor– Alarm sounds	MCS cannot read Processor temp.	PROC DOWN	0–Fatal

Summary

The PROCESSOR RTD timed out while measuring PROCESSOR temperature and communicating it to the MCS. (Refer to sheet 2 of the SYSTEM Functional Block/Wiring Diagram.) The PROCESSOR RTD changes resistance with changes in DRUM temperature. An AMPLIFIER senses the resistance changes on the MCS BOARD as voltage changes. A voltage–to–frequency circuit then converts the RTD input to a square–wave–frequency signal. This signal (PROC TEMP FREQ IN) represents DRUM temperature to the CPU of the MCS. The CPU samples this signal once a second, counting the pulses for 100ms. If the square wave pulse goes to steady-state DC for longer than a second, error 28-506 is declared. Power is applied to the processor HEATER and MOTOR 11 seconds into the power–on cycle. (Refer to Figure 7-3, MCS Self-Test Startup.)

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared by only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. De-energize the IMAGER and check CONNECTORS and wiring between the MCS BOARD (J17) and the RTD.
2. Use an OHMMETER to check that the RTD is not open. Resistance across the RTD should be 1k to 1.7K. If the RTD circuit is open, replace the DRUM ASSEMBLY.

8-5-77. 28-509: PROCESSOR Warmup Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Processor Warm-up Failure– Alarm sounds	Processor failed to warm up in the specified time.	PROC DOWN	0–Fatal

Summary

The PROCESSOR failed to warm up in the programmed time. (Refer to sheet 2 of the SYSTEM Functional Block/Wiring Diagram.) When power is applied to the IMAGER, the PROCESSOR DRUM turns on, controlled by the SSR DRUM PROC signal from the MCS BOARD. This pulse-width modulated signal remains low (active) until the PROCESSOR DRUM RTD indicates that the DRUM is at operating temperature. (See 28-506 for a description of RTD functions.) The normal warmup process takes from 18–20 minutes. As long as the SSR DRUM PROC signal is low, the K1 SOLID STATE RELAY on the PROCESSOR INTERFACE BOARD (PIB) routes 120 vac to the DRUM HEATER. (Note that the DRUM HEATER element circuit includes a resettable THERMAL BREAKER.) The 120 vac is applied through RELAY K2 on the PIB. The ac power should be present at J1 of the PIB as long as the TOP HOOD INTERLOCK is closed (HOOD down). The program generates the error as follows: Given the current-sensed DRUM temperature, the program estimates that with heat turned on the desired temperature level should be reached within a set time. If it is not, error 28-509 is declared.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared by only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Is the DRUM warm at all? If not, turn off IMAGER power, open the UPPER HOOD, and:
   a. Remove the 3 SCREWS from the END CAP of the HEATER. (Or remove 2 SCREWS and pivot the END CAP out of the way.)
   b. Check the THERMAL BREAKER BUTTON inside the DRUM. If it has popped out, pop it in with a SCREWDRIVER.
   c. Apply power and check if the BREAKER BUTTON pops back out. If it does, there is probably a short in the HEATER wiring, and the DRUM should be replaced. Otherwise, go to step 2.
2. Power off and check resistance of the HEATER element (through the SLIP RINGS). Resistance should be about 30 ohms. If the HEATER element is open, replace the DRUM.
3. Check that the RTD CABLE is plugged into the MCS BOARD (J17).

4. Check for other possible problems in the following order:
   - Loss of 120 vac. (Check at CONNECTOR J1 of the PIB. Pins 1 and 4 are “Line.” Pins 3 and 6 are “Neutral.”)
   - Low ac voltage (i.e., 120 vac is below spec). Check that the POWER TRANSFORMER is properly tapped (see paragraph 2-2-4).
   - Defective TOP HOOD INTERLOCK
   - Worn SLIP RINGS
   - Defective RELAY K1 or K2 on the PIB. (Replace the BOARD.)
   - Bad MCS BOARD (monitors DRUM temperature and turns on HEATER as required)

8-5-78. 28-551: PROCESSOR DRUM HEATER Failure

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Processor Heater Failure– Alarm sounds	Processor failed to warm up when heater turned on.	PROC DOWN	0–Fatal

Summary

The HEATER has been turned on, but the expected temperature rise did not occur. (Refer to sheet 2 of the SYSTEM Functional Block/Wiring Diagram.) When power is applied to the IMAGER, the PROCESSOR DRUM turns on, controlled by the SSR DRUM PROC signal from the MCS Board. This pulse-width modulated signal remains low (active) until the PROCESSOR DRUM RTD indicates that the DRUM is at operating temperature. (See 28-506 for a description of RTD functions.) The normal warmup process takes from 18-20 minutes. The HEATERS warm up at a rate of about 1.5 degrees C every 30 seconds when power is continuously applied. As long as the SSR DRUM PROC signal is low, the K1 SOLID STATE RELAY on the PROCESSOR INTERFACE BOARD (PIB) routes 120 vac to the DRUM HEATER. (Note that the DRUM HEATER element circuit includes a resettable THERMAL BREAKER.) The 120 vac is applied through RELAY K2 on the PIB. The ac power should be present at the J1 CONNECTOR of the PIB as long as the TOP HOOD INTERLOCK is closed (HOOD down).

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared by only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Is the DRUM warm at all? If not, turn off IMAGER power, open the TOP HOOD, and check for a short in the DRUM HEATER circuit as follows:
   a. Remove 3 SCREWS from the END CAP of the HEATER. (Or remove 2 SCREWS and pivot the END CAP out of the way.)
   b. Check the THERMAL BREAKER BUTTON inside the DRUM. If it has popped out, use a SCREWDRIVER to pop it back in.
   c. Apply power and check to see if the BREAKER BUTTON pops back out. If it does, there is probably a short in the HEATER wiring, and the DRUM should be replaced. Otherwise, proceed as follows.
2. Power off and check resistance of the HEATER ELEMENT (through the SLIP RINGS). Resistance should be about 30 ohms. If the HEATER ELEMENT is open, replace the DRUM.
3. Check that the RTD CABLE is plugged into the MCS BOARD (J17 on the upper right corner of the BOARD). Also check that calibration JUMPER PLUG JP7 is plugged into the NORM position on the BOARD.
4. Check for other possible problems in the following order:
   - Loss of 120 vac. (Check at CONNECTOR J1 of the PIB. Pins 1 and 4 are “Line.” Pins 3 and 6 are “Neutral.”)
   - Low ac voltage (i.e., 120 vac supply is below spec).
   - Defective TOP HOOD INTERLOCK
   - Worn SLIP RINGS

- Defective RELAY K1 or K2 on the PIB. (Replace the BOARD.)
- Bad MCS BOARD (monitors DRUM temperature and turns on HEATER as required)
- If the room temperature is set back during non–working hours, try bringing the room temperature up early so the IMAGER has more time to recover.

8-5-79. 28-554: PROCESSOR Over Temperature Error

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Processor Over Temperature– Alarm sounds	Processor over temperature	PROC DOWN	0–Fatal

Summary

The DRUM temperature is too high and the PROCESSOR HEATER has been turned off. When power is applied to the IMAGER and the TOP HOOD is closed, 120 volts ac is applied to the PROCESSOR HEATER through a RELAY on the PROCESSOR INTERFACE BOARD, under control of the MASTER CPU on the MCS Board. The PROCESSOR RTD senses changes in HEATER temperature and reports them to the MASTER CPU. Failure to control temperature probably indicates that the RTD is open, there is a short in the DRUM wiring, or a control circuit on the MCS BOARD is defective.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared only by restarting the IMAGER.

Related Errors

- 28-506 PROCESSOR Communication Failure — RTD timed out while communicating PROCESSOR temperature to MCS.
- 28-509 PROCESSOR Warmup Failure — Desired temperature level was not reached within set time (18–20 minutes).
- 28-551 PROCESSOR DRUM HEATER Failure — HEATERS did not warm up at the desired rate of 1.5°C every 30 seconds.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

Check for a possible short in HEATER wiring as follows:

1. Power down and open the TOP HOOD.
2. Remove the 3 SCREWS from the END CAP of the HEATER. (Or remove 2 SCREWS and pivot the END CAP out of the way.)
3. Check the THERMAL BREAKER BUTTON inside the DRUM. If it has popped out, use a SCREWDRIVER to pop it back in.
4. Apply power and check to see if the BREAKER BUTTON pops back out. If it does, there is probably a short in the HEATER wiring, and the DRUM should be replaced.
5. With a multimeter connected to TP8 on the MCS BOARD, monitor the voltage as the drum warms up. Normally, during warmup, the voltage increases steadily in small increments (about 0.1V), and the green LED on the PIB is constantly illuminated. When the PROCESSOR reaches temperature, the LED flashes on and off. If there is a sudden voltage spike (up to 5V) during warmup, suspect a failed RTD . Replace the DRUM, and monitor again.

Check for other possible causes:
- Low ambient room temperature where the IMAGER is located.
- Low AC supply at the RECEPTACLE (AC supply below spec).

- POWER MODULE JUMPERS tapped incorrectly.
- Loose RTD CABLE on the MCS BOARD (J17 at the top of the BOARD).
- Worn or defective SLIP RING.
- Defective TOP HOOD INTERLOCK.

Work Around:

- Power cycle to start the warming sequence from the current PROCESSOR temperature.
- If the room temperature is set back during non-working hours, try bringing the room temperature up early so the IMAGER has more time to recover.
- Install a STEP–UP TRANSFORMER.

8-5-80. 29-924: DENSITOMETER Offset Failure with Light Source Off

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Diagnostic Failure: Densitometer– Alarm Sounds	Densitometer offset reading out of range with light source off	ELEC DOWN	0–Fatal

Summary

Before every print and during diagnostics, a reading of the Density Sensor is taken with the Light Source turned off. If this reading is outside the specified range, this error is declared

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Perform the DENSITOMETER reference level adjustment, paragraph 3-5.
2. Check the MCS Log for the message “DENSITOMETER diag failed.”
3. Check the RJ-45 CONNECTORS and the cabling between the MCS BOARD and DENSITOMETER BOARD.
4. Swap RJ-45 CONNECTORS on the MCS BOARD as follows:
   a. Power off.
   b. Swap the RJ-45 for the DENSITOMETER with the RJ-45 CONNECTOR for any of the other *MicroComm* peripherals.
   c. Power up.
   d. Check whether the other *MicroComm* peripheral failed. If it did, the RJ-45 or cabling is bad.
5. If the RJ-45 CONNECTORS and cabling are OK, very likely either the DENSITOMETER BOARD or its LIGHT SOURCE BOARD is defective.

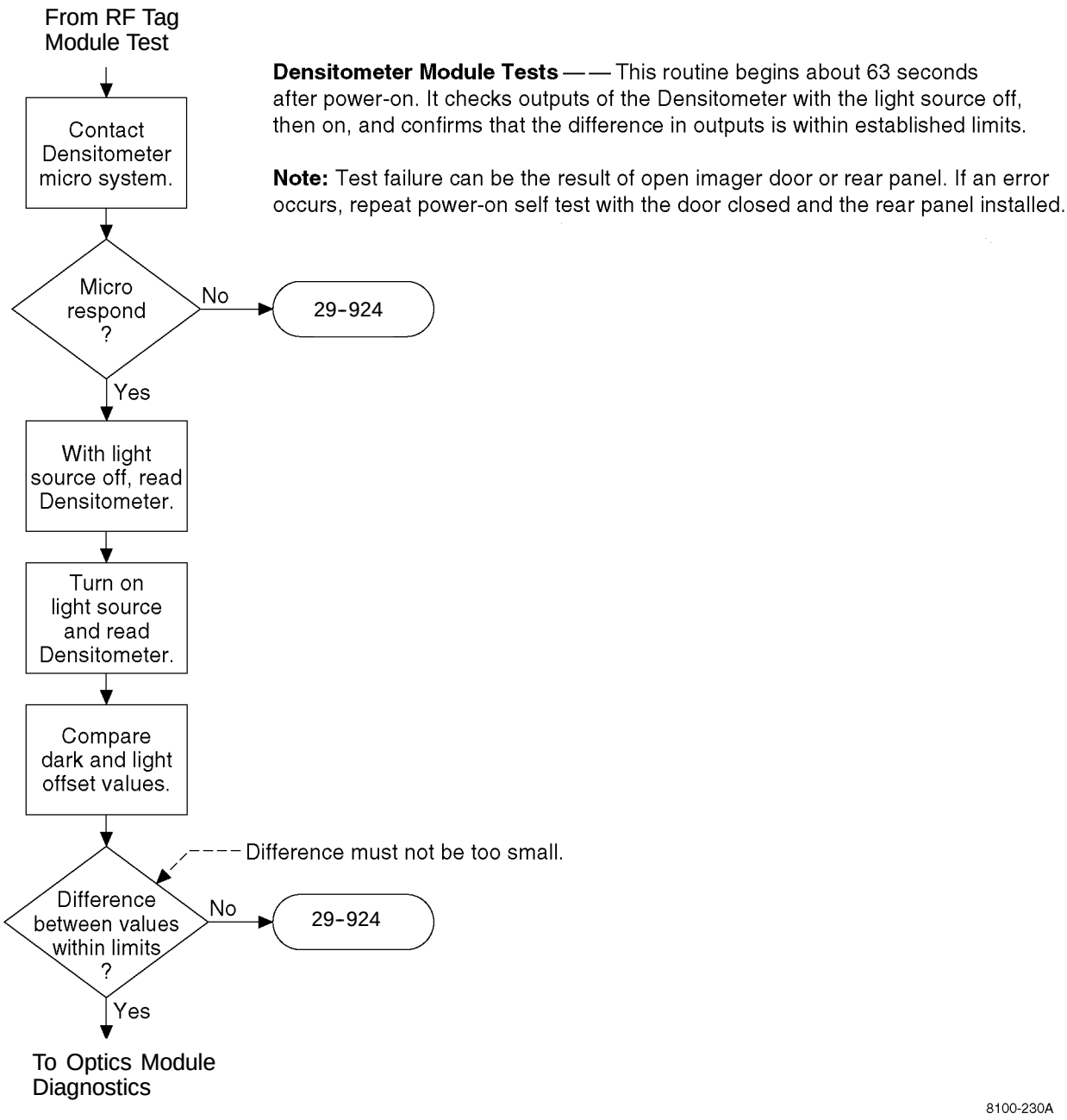

From RF Tag Module Test
Contact Densitometer micro system.
Micro respond ?
No
29-924
Yes
With light source off, read Densitometer.
Turn on light source and read Densitometer.
Compare dark and light offset values.
Difference must not be too small.
Difference between values within limits ?
No
29-924
Yes
To Optics Module Diagnostics
Densitometer Module Tests — — This routine begins about 63 seconds after power-on. It checks outputs of the Densitometer with the light source off, then on, and confirms that the difference in outputs is within established limits.
Note: Test failure can be the result of open imager door or rear panel. If an error occurs, repeat power-on self test with the door closed and the rear panel installed.
8100-230A

Figure 8-4. DENSITOMETER Module Diagnostics

8-5-81. 29-925: DENSITOMETER Offset Failure with Light Source On

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Diagnostic Failure: Densitometer– Alarm sounds	Densitometer offset reading out of range with light source on	ELEC DOWN	0–Fatal

Summary

Before every print and during diagnostics, a reading of the Density Sensor is taken with the Light Source turned on. If this reading is outside the specified range, this error is declared.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

Perform the DENSITOMETER reference level adjustment, paragraph 3-5.

8-5-82. 29-931: MCS Cannot Communicate with DENSITOMETER

LOCAL PANEL Message	Log Message	DICOM Message	Severity
Internal Communications Failure: Densitometer– Alarm sounds	MCS failed to communicate with Densitometer after 5 attempts	ELEC DOWN	0–Fatal

Summary

This error occurs if the MCS tries to communicate with the DENSITOMETER MICRO, but receives no response after 5 attempts.

Result of Error

The IMAGER is unable to print film. It can accept and queue new jobs, but it will not initiate new films. All films in the IMAGER will be reprinted. The error can be cleared only by restarting the IMAGER.

User Action

1. Restart the IMAGER.
2. If the error persists, call Service.

FE Action

1. Perform the DENSITOMETER reference level adjustment, paragraph 3-5.

8-5-83. 29-932: MCS Cannot Communicate with DENSITOMETER Notification

LOCAL PANEL Message	Log Message	DICOM Message	Severity
None	MCS failed to communicate with Densitometer	NORMAL	3–Notify

Summary

This notification to the Log occurs if the MCS tries to communicate with the DENSITOMETER MICRO, but receives no response. If 5 failures occur in succession, error 29-931 is declared.

Result of Error

None. The IMAGER will function normally.

User Action

None

FE Action

None

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Section 9 – Illustrated Parts Breakdown

Figure 9-0. SYSTEM OVERVIEW

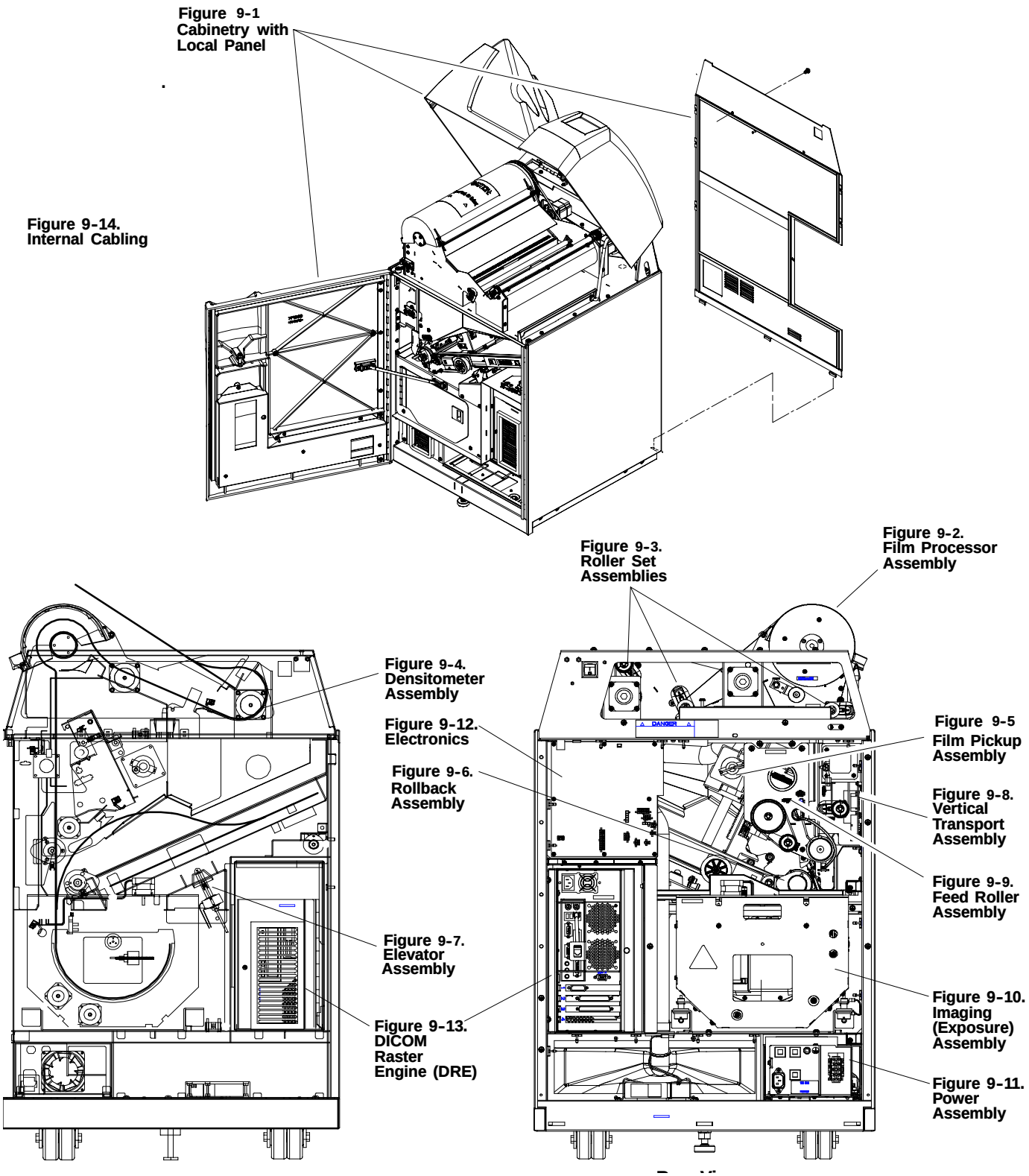


Figure 9-1. CABINETRY WITH LOCAL PANEL

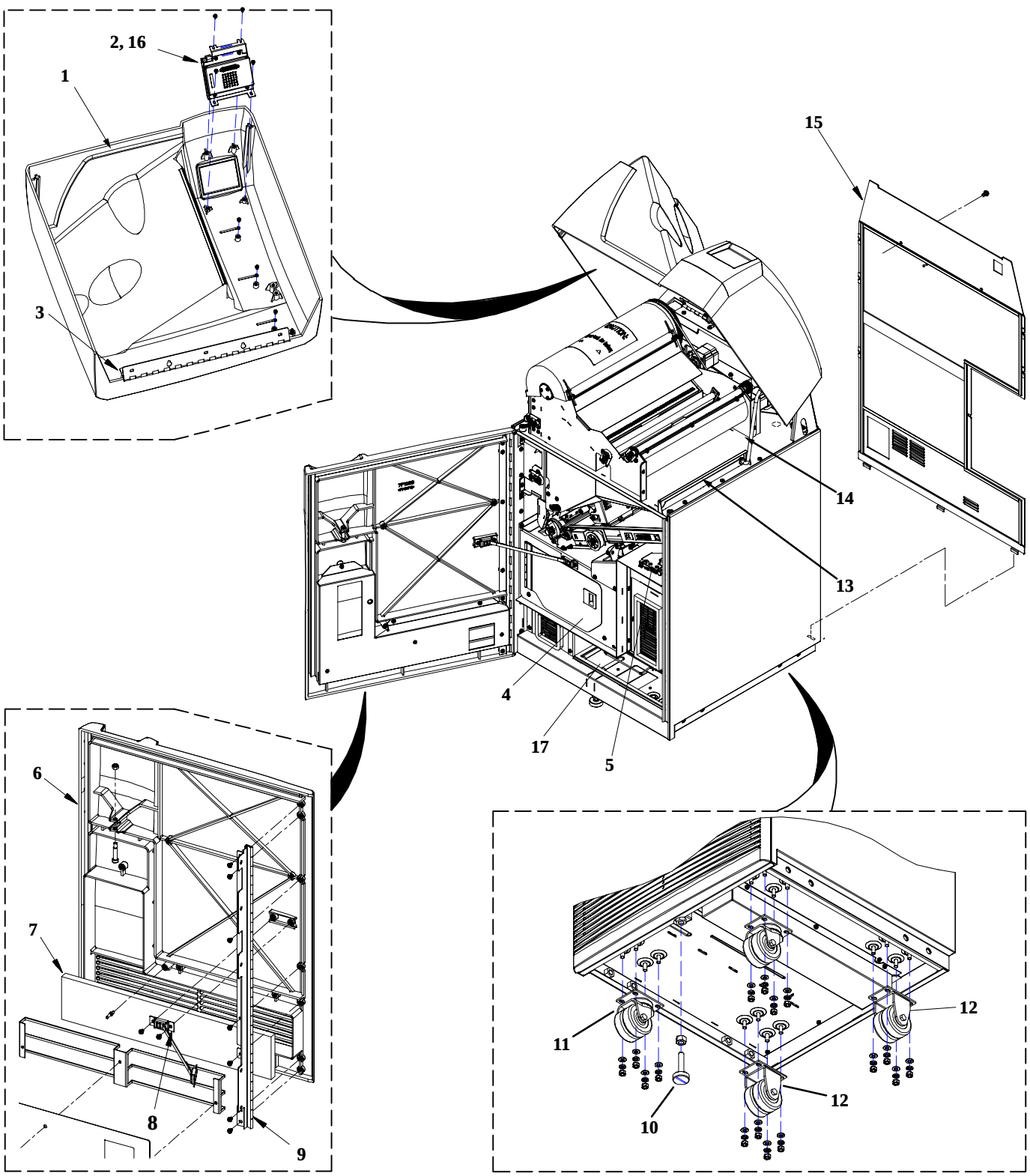
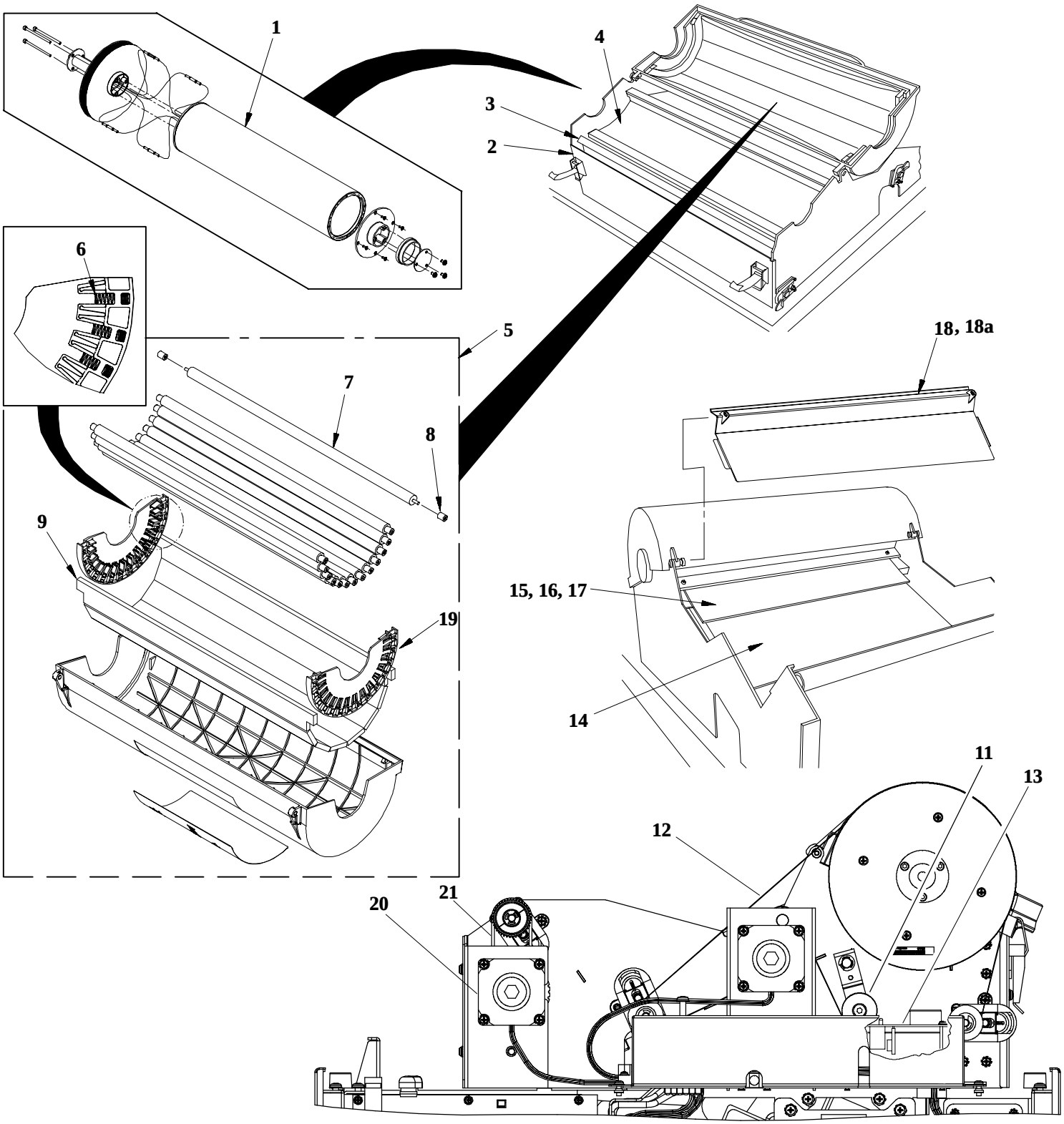


Figure 9-1. CABINETRY WITH LOCAL PANEL

Item No.	Part Number	Description	Qty
1	Not Available	HOOD ASSEMBLY (Includes items 2 and 3)	1
2	SP7F1046	LOCAL PANEL ASSEMBLY	1
3	Not Available	HINGE, Hood	1
4	Not Available	PLATEN ACCESS DOOR ASSEMBLY	1
5	SP96–0000–2906–4	LATCH AND SOLENOID ASSEMBLY	1
6	SP7F1015	FRONT DOOR ASSEMBLY (Includes items 7 though 9)	1
7	SP96–0000–2755–5	FILTER, Door	1
8	Not Available	LANYARD, Front Door	1
9	SP7F1016	HINGE, Front Door	1
10	SP7F1074	SCREW, Stop, Main	1
11	Not Available	CASTER, Swivel	2
12	Not Available	CASTER, Fixed	2
13	Not Available	GUIDE, Prop–Rod, Hood	1
14	Not Available	PROP–ROD ASSEMBLY, Hood	1
15	SP7F1094	BACK PANEL ASSEMBLY	1
16	SP8F0043	CABLE ASSEMBLY, Local Panel	1
17	SP96–0000–5190–2	FILTER KIT	1
18A	SP26–1011–4940–4	POWER CORD, U.S., UL/CSA Rated only (Not shown)	1
18B	SP78–8077–4272–7	POWER CORD, International (Not shown)	1

Figure 9-2. FILM PROCESSOR ASSEMBLY



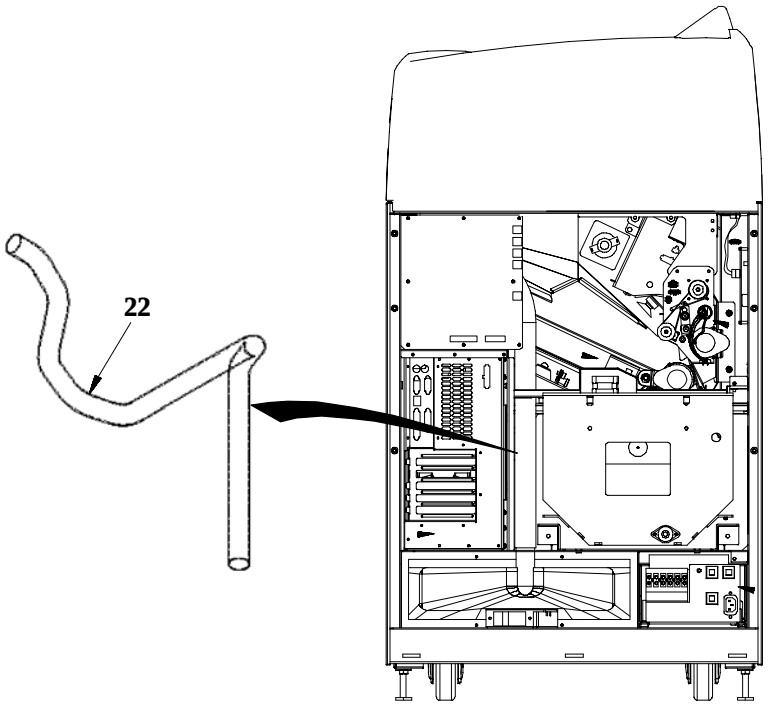


Figure 9-2. FILM PROCESSOR ASSEMBLY, Sheet 2

Item No.	Part Number	Description	Qty
1	SP8E5626	DRUM ASSEMBLY KIT	1
2	SP7F1084	LATCH PLATE ASSEMBLY	1
3	Not Available	GUIDE, Left Vertical, Processor	1
4	SP96–0000–1368–8	INSULATOR, Lower Processor	1
5	SP74–0500–5501–6	PROCESSOR COVER ASSEMBLY KIT (Includes items 6 through 9 and 19	1
6	SP96–0000–0403–4	SPRING, Processor Roller	28
7	SP74–0401–8359–7	ROLLER, Processor, Aluminum	14
8	SP96–0000–0404–2	BEARING, Pressure Roller	28
9	SP96–0000–3026–0	INSULATION, Cover, Processor	1
10	SP7F1215	MOTOR, Processor	1
11	SP7F1078	BELT TENSIONER ASSEMBLY	1
12	SP5F1223	BELT	1
13	SP96–0000–3585–5	PROCESSOR INTERFACE BOARD ASSEMBLY	1
14	SP96–0000–0989–2	PLATE, Cooling, Post Processor	1
15	SP78–8075–4070–9	DIVERTER AND FELT ASSEMBLY KIT (includes items 16 and 17a)	1
16	SP74–0401–8269–8	FELT PAD	1
17	SP74–0401–8217–7	FILM DIVERTER w/o Kapton	1
18	SP96–0000–3975–8	THERMAL SHIELD ASSEMBLY	1
18a	96–0000–5351–0	GASKET, Hi TEMP, SILICONE SPONGE (PROCESSOR GASKET)	1
19	SP96–0000–0406–7	RETAINER, PROCESSOR PRESSURE ROLLER	2
20	SP7F1226	MOTOR, EXIT, STEPPER	1
21	SP96–0000–4200–0	BELT, EXIT	1
22	SP96–0000–1354–8	DUCT, FLEXIBLE, PROCESSOR FILTER	1

Figure 9-3. ROLLER SET ASSEMBLIES

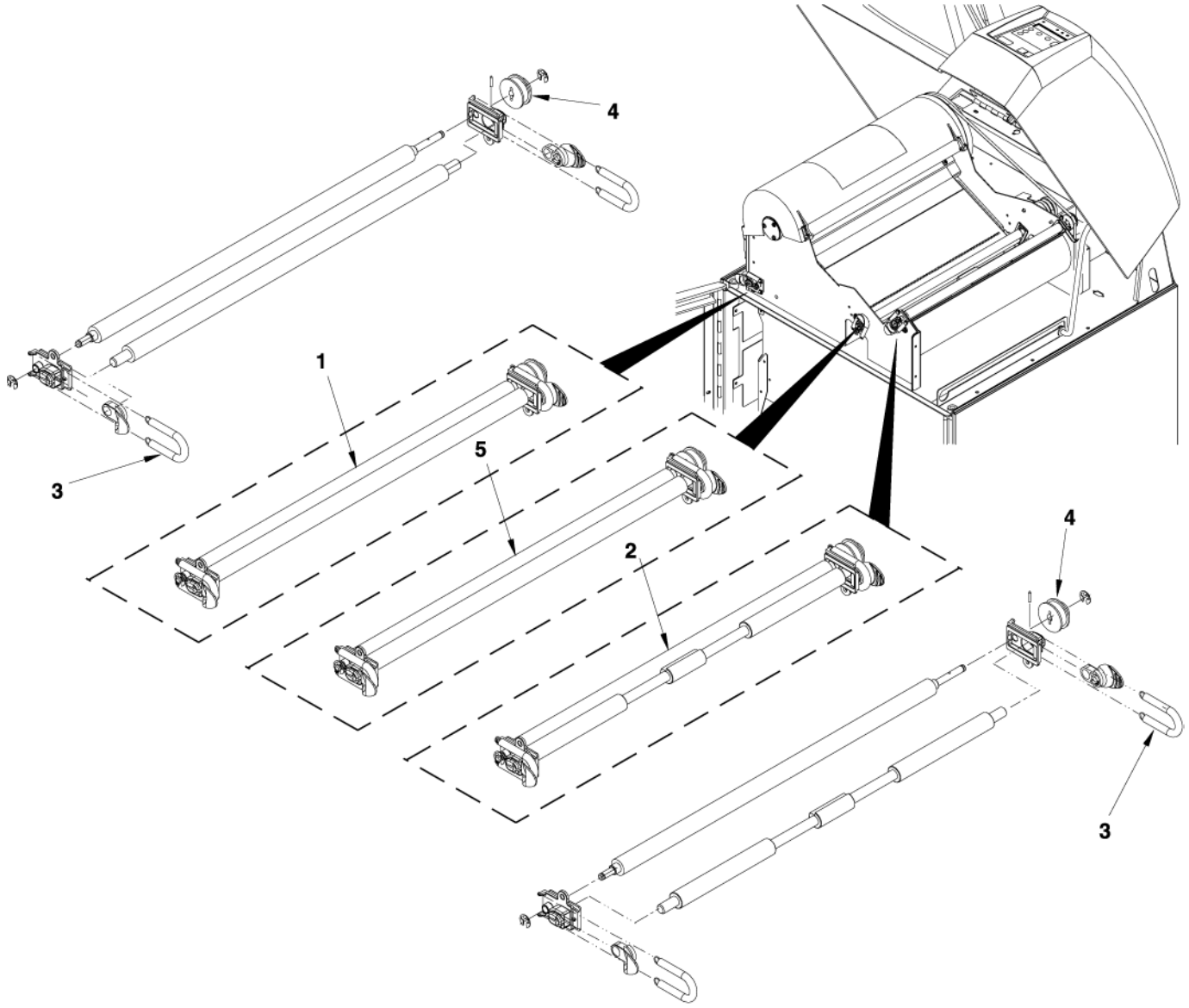


Figure 9-3. ROLLER SET ASSEMBLIES

Item No.	Part Number	Description	Qty
1	SP7F1006	ROLLER SET ASSEMBLY (Includes items 3 and 4)	1
2	SP7F1008	ROLLER SET EXIT ASSEMBLY (Includes items 3 and 4)	1
3	Not Available	SPRING, External, SST, .75 Long (2 per roller set)	6
4	SP96–0000–1324–1	PULLEY, 40dp, 40 Tooth (1 per roller set)	3
5	SP7F1007	ROLLER SET ASSEMBLY, POST–PROCESSOR (Includes items 3 and 4)	1

Figure 9-4. DENSITOMETER ASSEMBLY

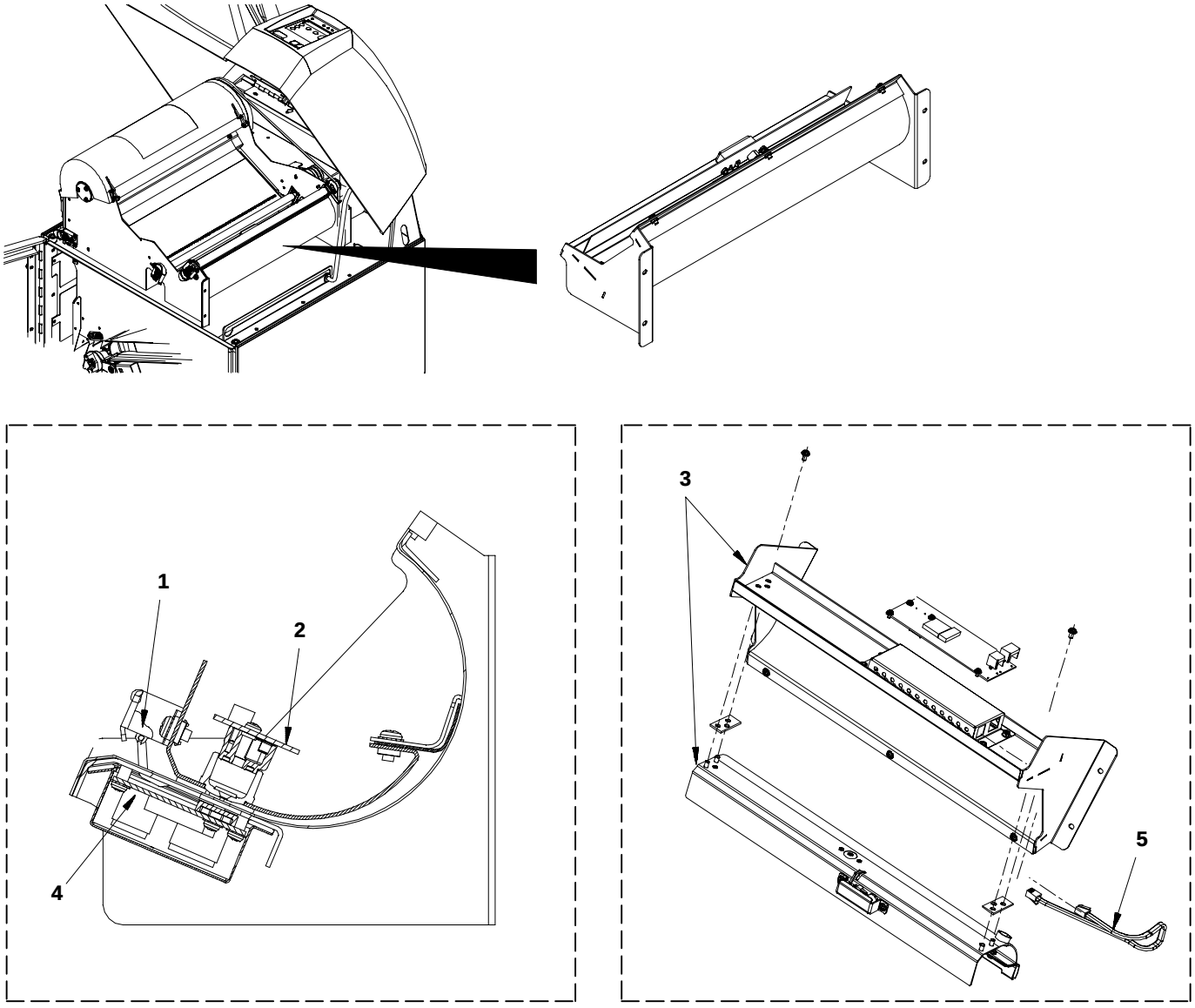


Figure 9-4. DENSITOMETER ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP96–0000–0486–9	SWITCH, Optical, Flag (Densitometer/Exit S9)	1
2	SP96–0000–1357–1	PC BOARD ASSEMBLY, Densitometer Light Source	1
3	SP96–0000–1307–6	TURNAROUND (Includes 1, 2, 4, and 5)	1
4	SP96–0000–3898–2	DENSITOMETER BOARD ASSEMBLY	1
5	SP96–0000–2852–0	CABLE, Lightsource	1
6	SP96–0000–2510–4	CABLE, Densitometer, MicroComm (not shown)	1

Figure 9-5. FILM PICKUP ASSEMBLY

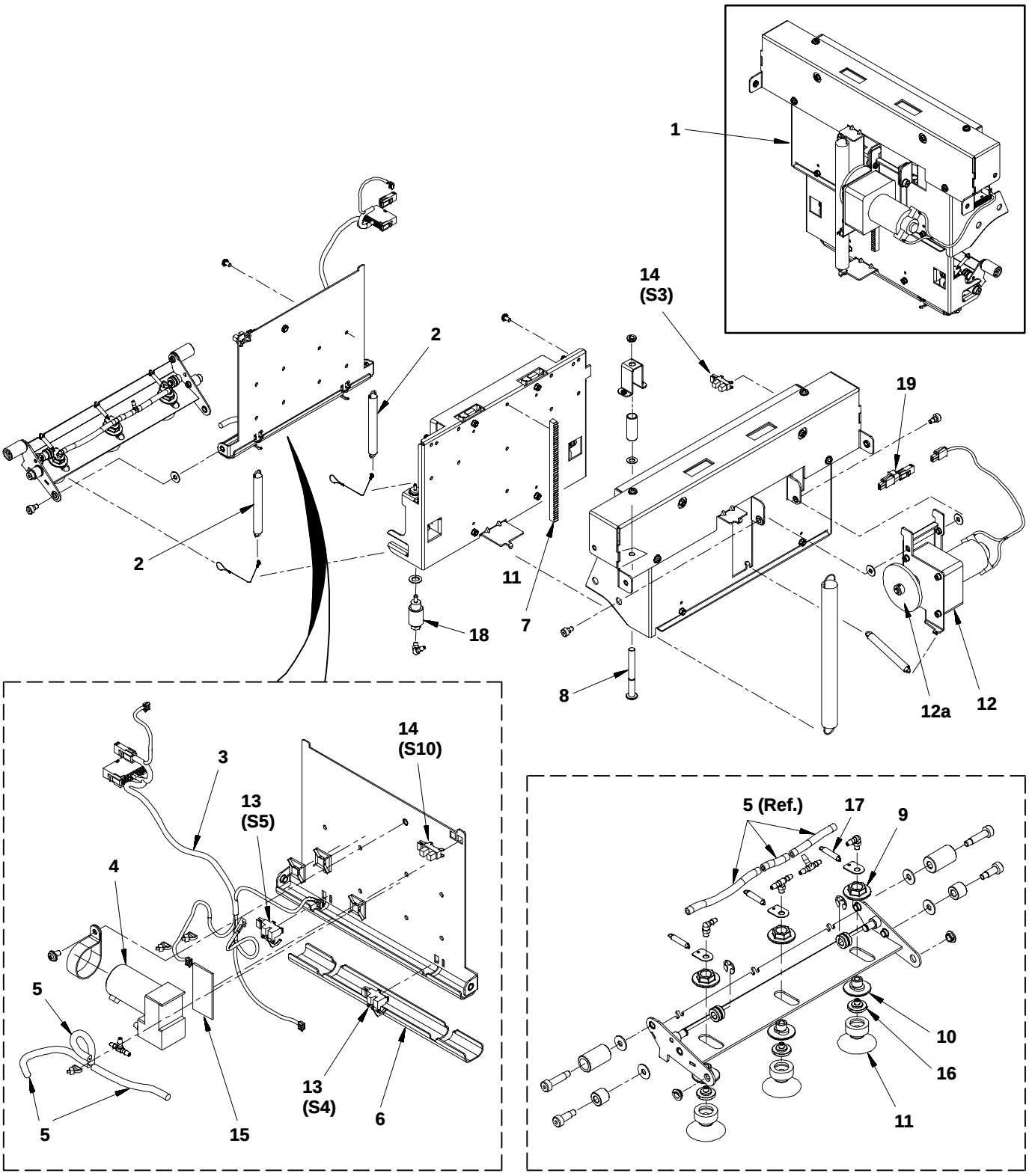


Figure 9-5. FILM PICKUP ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP8F0279	PICKUP ASSEMBLY (Includes items 2 through 19)	1
2	SP74–0500–4076–0	SPRING, Cup Plate, Film Pickup	2
3	SP96–0000–2846–2	HARNESS, Pickup	1
4	SP8E9184	VACUUM PUMP ASSEMBLY	1
5	SP7F1208	TUBING, Silicone	1
6	SP7F1214	PAD, Heel, Film Pickup	1
7	Not Available	RACK, Film Pickup	1
8	SP96–0000–1388–6	PLUNGER, Valve, Film Pickup	1
9	SP96–0000–4219–0	SLIDER, Top, Film Pickup	3
10	SP96–0000–4220–8	SLIDER, Bottom, Film Pickup	3
11	SP78–8094–5694–6	CUP, Round, Film Pickup	3
12	SP7F1219	PICKUP MOTOR ASSEMBLY (DCM2)	1
12a	SP7F1220	GEAR–MOTOR, PICKUP	1
13	SP96–0000–0486–9	SWITCH, Optical, Flag (Film Surface S4, Film Out S5)	2
14	SP96–0000–0482–8	SWITCH, Optical, Interrupt (Pickup Position S3, Cups Engaged S10)	2
15	SP96–0000–4233–1	TAPE, VHB, Acrylic Foam	1
16	SP8E4919	SCREW, Cup, Film Pickup	3
17	SP96–0000–1328–2	SPRING, Film Cups/Platen Sliders	3
18	SP5F0626	VALVE, Poppet, Film Pickup	1
19	SP70–0701–4519–1	CABLE, Filter, Pickup Motor	1

Figure 9-6. ROLLBACK ASSEMBLY, RF TAG

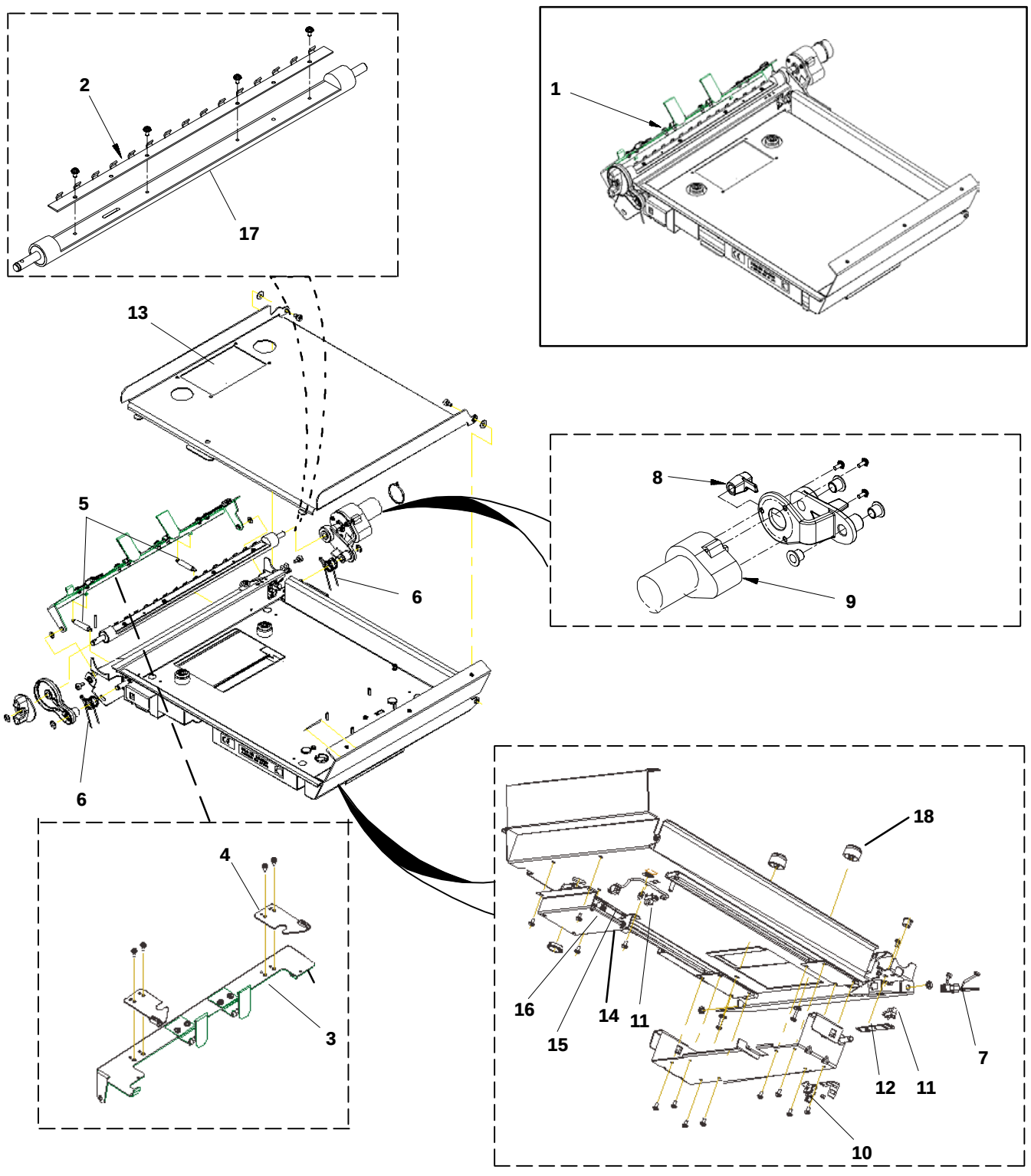


Figure 9-6. ROLLBACK ASSEMBLY, RF TAG

Item No.	Part Number	Description	Qty
1	SP8F0688	ROLLBACK ASSEMBLY (Includes items 2 through 18)	1
2	SP7E2832	TEETH ROLLER, Rollback	1
3	SP74–0401–6529–7	FILM GUARD ASSEMBLY	1
4	SP96–0000–4221–6	TAB, SEPARATOR, Film	2
5	SP96–0000–2669–8	SPRING, External, .30 D x .037 W x 1.75 Long	2
6	SP7F1069	SPRING, Rollback	2
7	SP74–0401–9144–2	HARNESS, Rollback Sensor	1
8	SP96–0000–3591–3	COUPLER, Roller, Rollback	1
9	SP96–0000–2476–8	MOTOR, DC, Rollback (DCM1)	1
10	SP7E2883	SWITCH, Optical, Flag (Cartridge Present S1)	1
11	SP96–0000–0482–8	SWITCH, Optical, Interrupt (Rollback Home S2, Rollback Open S13)	2
12	SP96–0000–1371–2	MOUNT, Sensor, Home, Rollback	1
13	SP8E5834	RF TAG ANTENNA BOARD	1
14	SP8E7300	RF TAG ASSEMBLY (Includes items 15 and 16)	1
15	No Number	RF TAG INTERFACE BOARD	1
16	No Number	RF READER BOARD (TRANSCEIVER)	1
17	SP8E7082	ROLLER, Rollback	1
18	SP96–0000–5208–2	LOCATOR, Cartridge	2

Figure 9-7. ELEVATOR ASSEMBLY

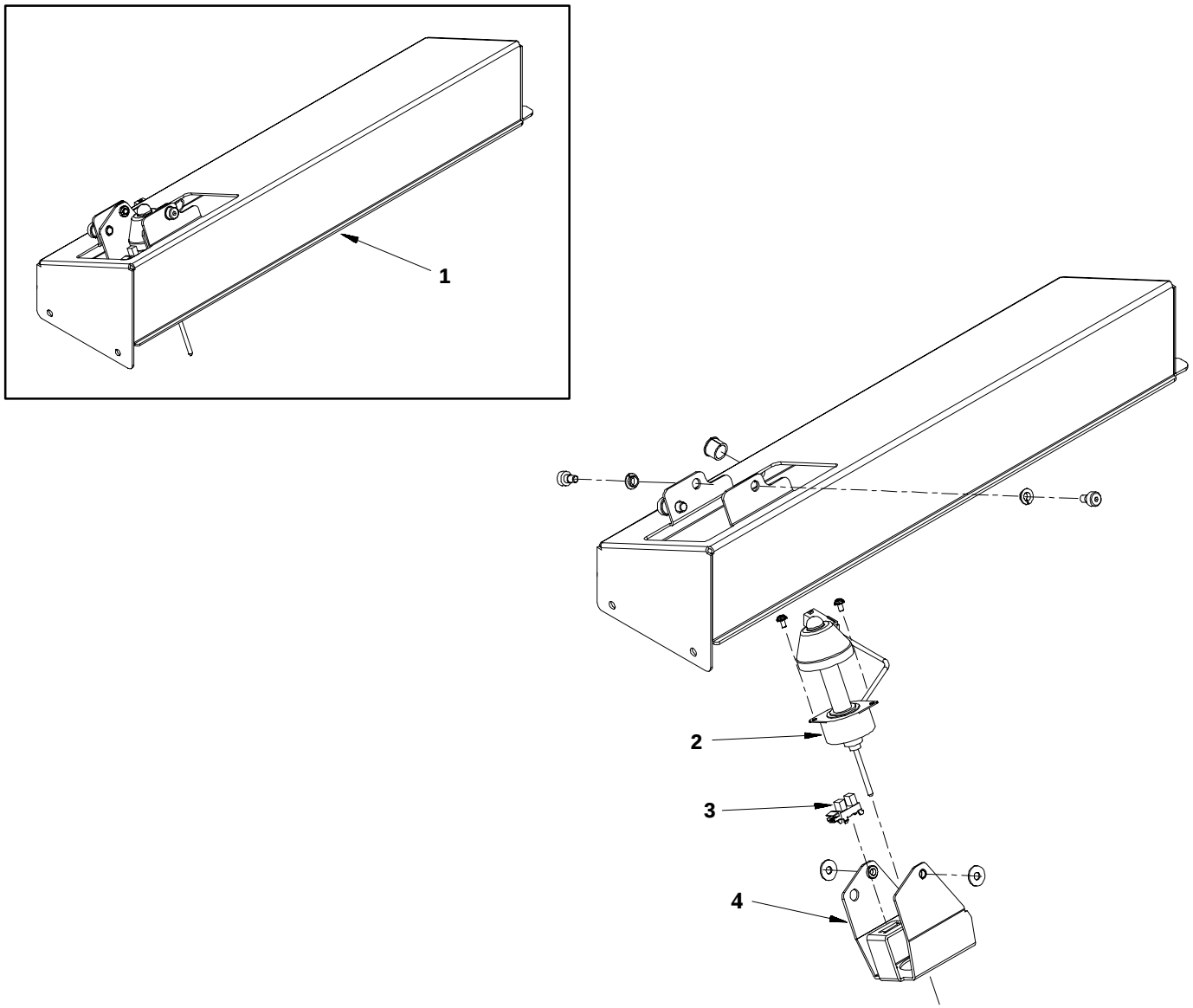


Figure 9-7. ELEVATOR ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP8F0278	ELEVATOR ASSEMBLY (Includes items 2 through 4)	1
2	SP96-0000-5407-0	ELEVATOR MOTOR ASSEMBLY (Step8)	1
3	SP96-0000-0482-8	SWITCH, Interrupt, Optical (Elevator Home S12)	1
4	Not Available	MOTOR MOUNT, Elevator	1

Figure 9-8. VERTICAL TRANSPORT ASSEMBLY

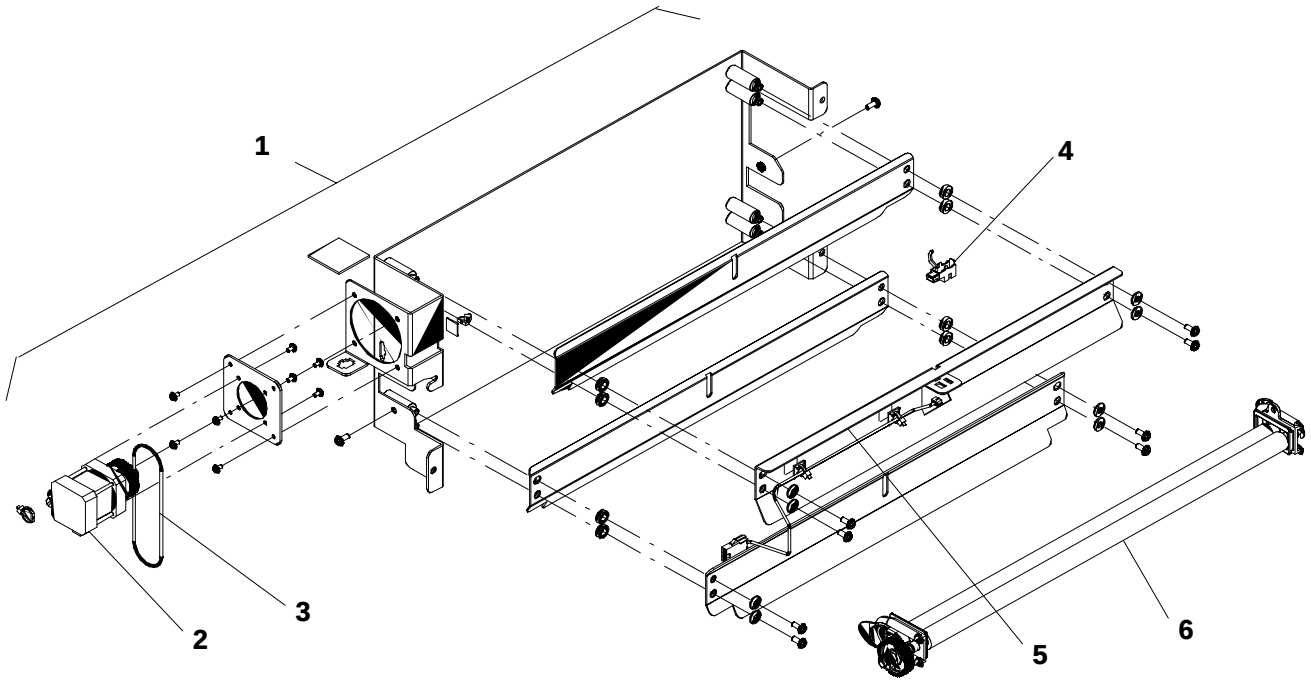


Figure 9-8. VERTICAL TRANSPORT ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP8F0280	VERTICAL TRANSPORT ASSEMBLY (Includes items 2 – 6)	1
2	SP7F1183	STEPPER MOTOR AND SPROCKET ASSY (Step 6U)	1
3	SP96–0000–4200–0	BELT	1
4	SP96–0000–0486–9	SWITCH, Optical, Flag (Upper Vert. Transport S8U)	1
5	SP74–0401–9156–6	CABLE, Sensor	1
6	SP7F1027	ROLLER ASSEMBLY, Vertical	1

Figure 9-9. FILM FEED ROLLER ASSEMBLY

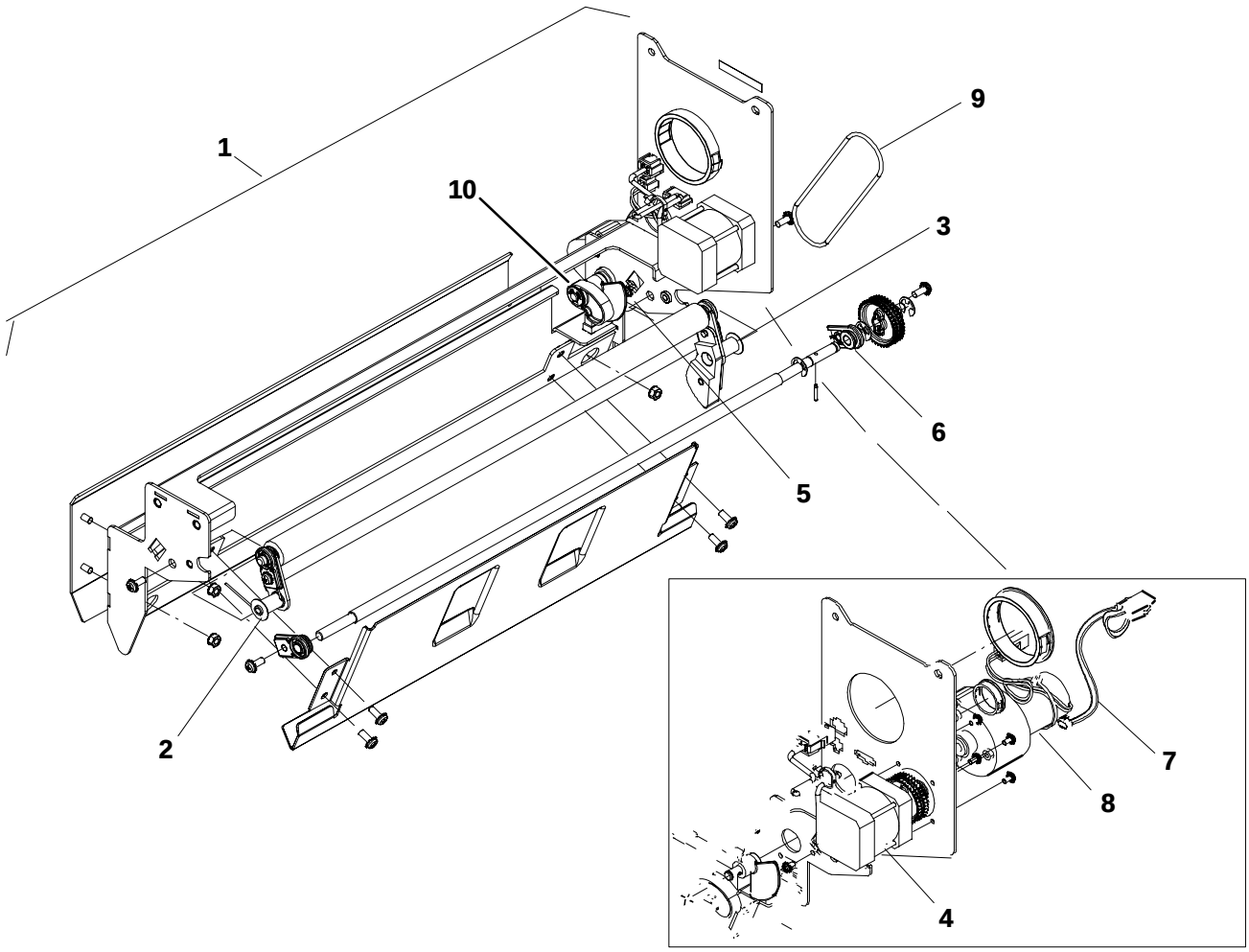


Figure 9-9. FILM FEED ROLLER ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP8F0277	FILM FEED ROLLER ASSEMBLY	2
2	SP96-0000-1383-7	SPRING, Torsion, Left Handed	1
3	SP96-0000-1384-5	SPRING, Torsion, Right Handed	1
4	SP7F1183	STEPPER MOTOR AND SPROCKET ASSEMBLY	1
5	SP96-0000-0482-8	SWITCH, Optical, Interrupt	1
6	SP7E8007	BEARING, Roller, Individual	2
7	SP96-0000-2850-4	CABLE, Sensor, Feed Rollers	1
8	SP7F1030	MOTOR, DC, Feed Rollers	1
9	SP96-0000-4200-0	BELT	1
10	SP96-0000-4079-8	CAM, Driver, Feed Roller	1

Figure 9-10. IMAGING (EXPOSURE) ASSEMBLY

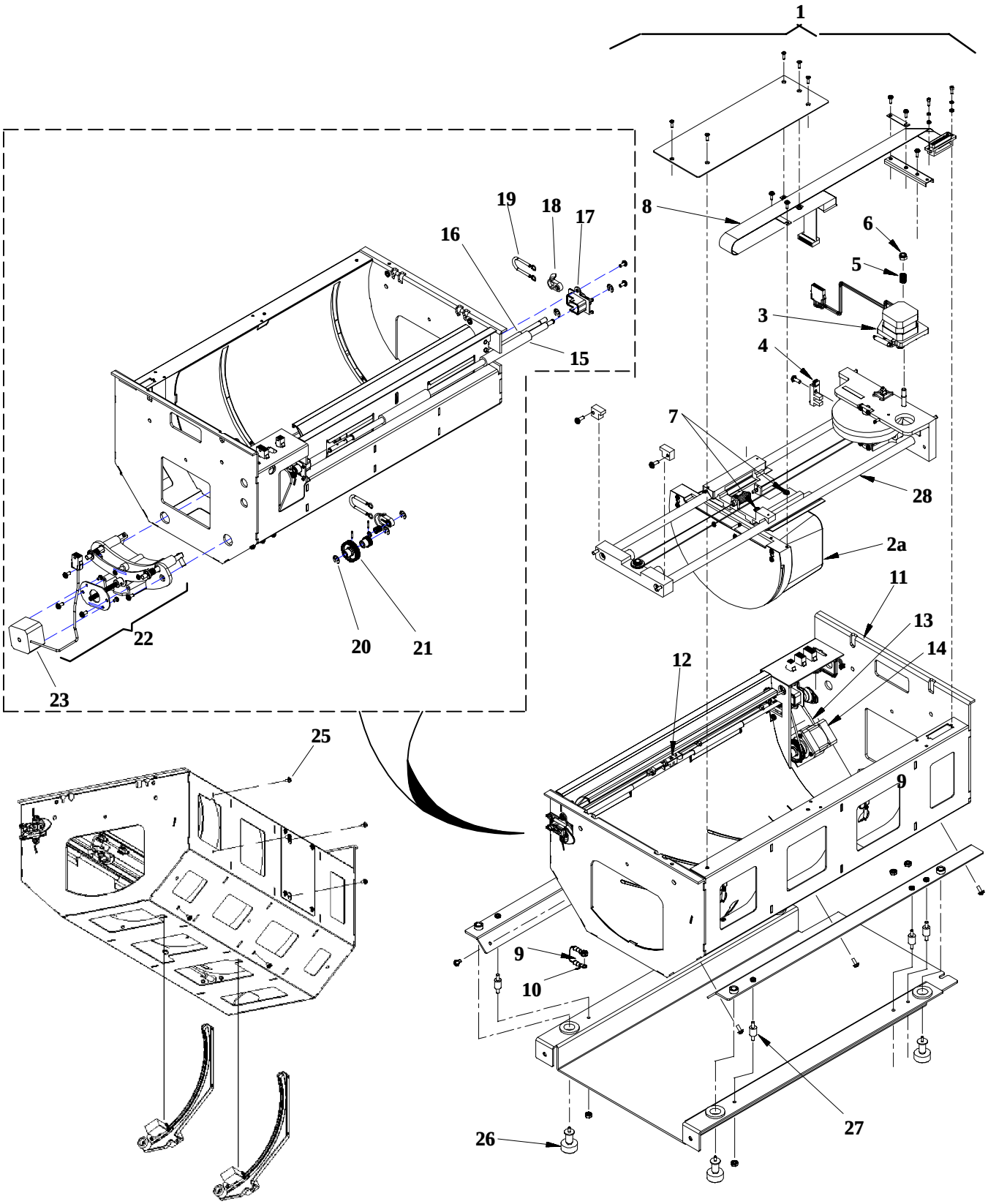


Figure 9-10. IMAGING (EXPOSURE) ASSEMBLY

Item No.	Part Number	Description	Qty
1	Not available	IMAGING (EXPOSURE) ASSEMBLY	1
2	Not available	SCANNER MODULE KIT (Includes Optics Module, Optics Translation Module and items 3 through 7)	1
2a	SP8E7337	OPTICS FRU	1
3	SP96-0000-5458-3	STEPPER MOTOR MOUNTING ASSY (Optics Translation Step 4)	1
4	SP96-0000-0850-6	SWITCH, Optical, Flag (Optics Home S7)	1
5	SP96-0000-2577-3	COMPRESSION SPRING, Stepper Motor	1
6	SP96-0000-2573-2	NUT, Hex, Metric, M6 x 1.0	1
7	SP26-1003-7485-4	SCREW, Pan, Sems, M4, 7 x 16	3
8	SP96-0000-2864-5	CABLE, Ribbon, Optics Module	1
9	SP74-0500-5708-7	CABLE, Ground Strap	1
10	SP26-1003-7119-9	SCREW, Pan, Sems, M4, 7 x 06	2
11	SP8F0272	PLATEN ASSEMBLY (Includes items 12 through 27)	1
12	SP70-0701-4483-0	SWITCH, Optical, Flag (Platen Film S6)	1
13	SP96-0000-4200-0	BELT	1
14	SP7F1183	STEPPER MOTOR ASSEMBLY (Platen Roller Step 2)	1
15	SP7F1018	ROLLER, Drive, Platen	1
16	SP7F1019	ROLLER, Idler, Platen	1
17	SP80-9550-2862-8	BEARING BLOCK, Base	2
18	SP96-0000-0383-8	BEARING BLOCK, Slide	2
19	SP96-0000-2624-3	SPRING, External	2
20	SP12-7996-2818-0	E-RING, 1/4 in. Shaft Dia.	1
21	SP96-0000-4167-1	SPROCKET, 32dp, .098 40 Tooth, Platen	1
22	SP7F1057	PLATEN CENTERING ASSY (Film Centering Step 7)	1
23	SP7F1185	Motor-Stepper, Linear, Centering	1
24	SP7F1025	GRAVITY CAR ASSEMBLY	2
25	SP26-1003-7119-9	SCREW, Pan, Sems, M4, 7 x 06	6
26	SP96-0000-1325-8	SCREW, Shoulder, Platen	4
27	SP26-1011-6195-3	MOUNT, Vibration Control	8
28	SP8E8757	TRANSLATOR ASSEMBLY (includes items 3 – 6)	1

Figure 9-11. POWER ASSEMBLY

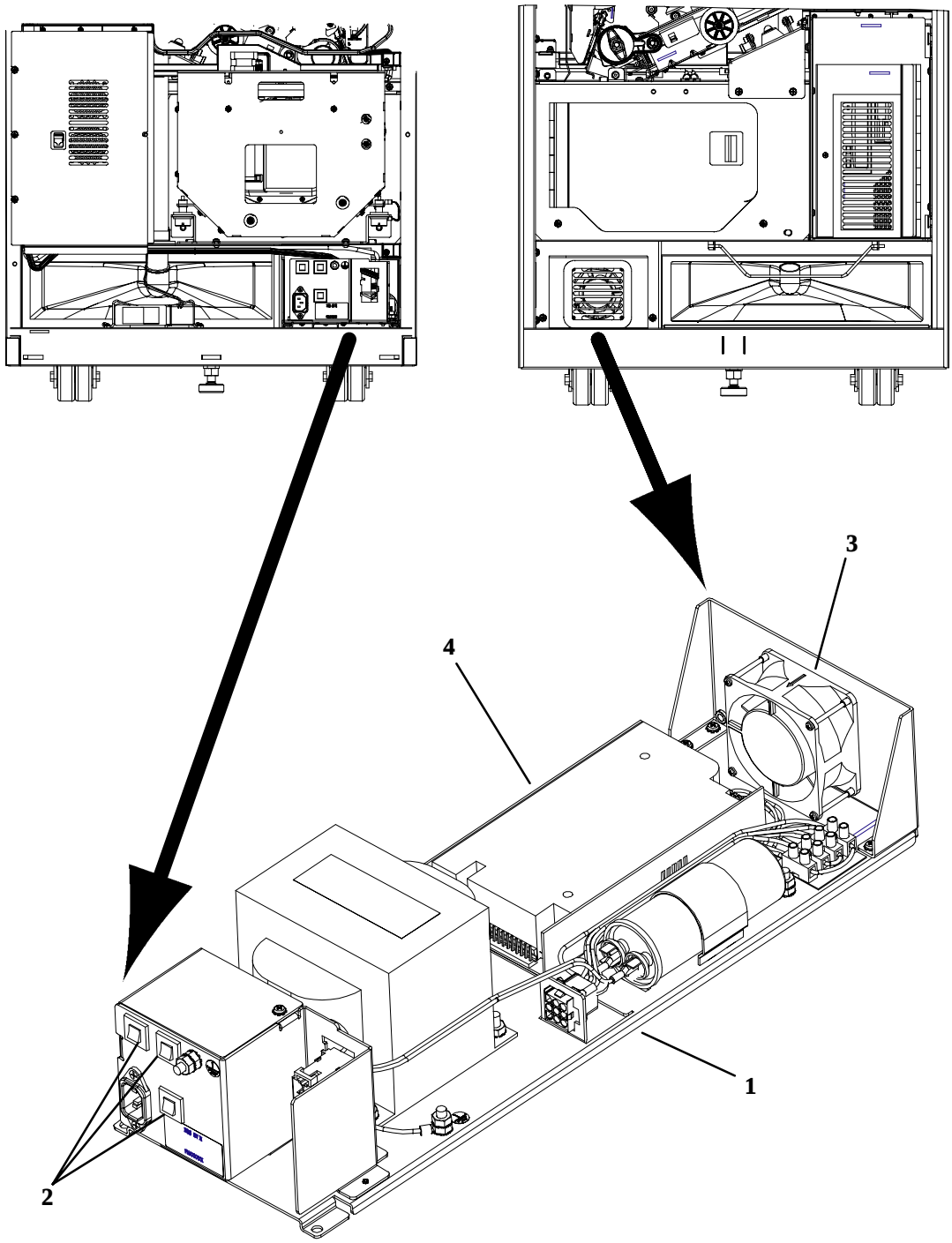


Figure 9-11. POWER ASSEMBLY

Item No.	Part Number	Description	Qty
1	SP8F2394	POWER MODULE KIT (Includes items 2 through 5)	1
2	SP96–0000–3705–9	CIRCUIT BREAKER (CB1, CB2, CB3)	3
3	SP96–0000–3703–4	FAN, Power Module	1
4	SP96–0000–3709–1	POWER SUPPLY	1
5	SP96–0000–2174–9	SEAL, Power Module (not shown)	1

Figure 9-12. ELECTRONICS

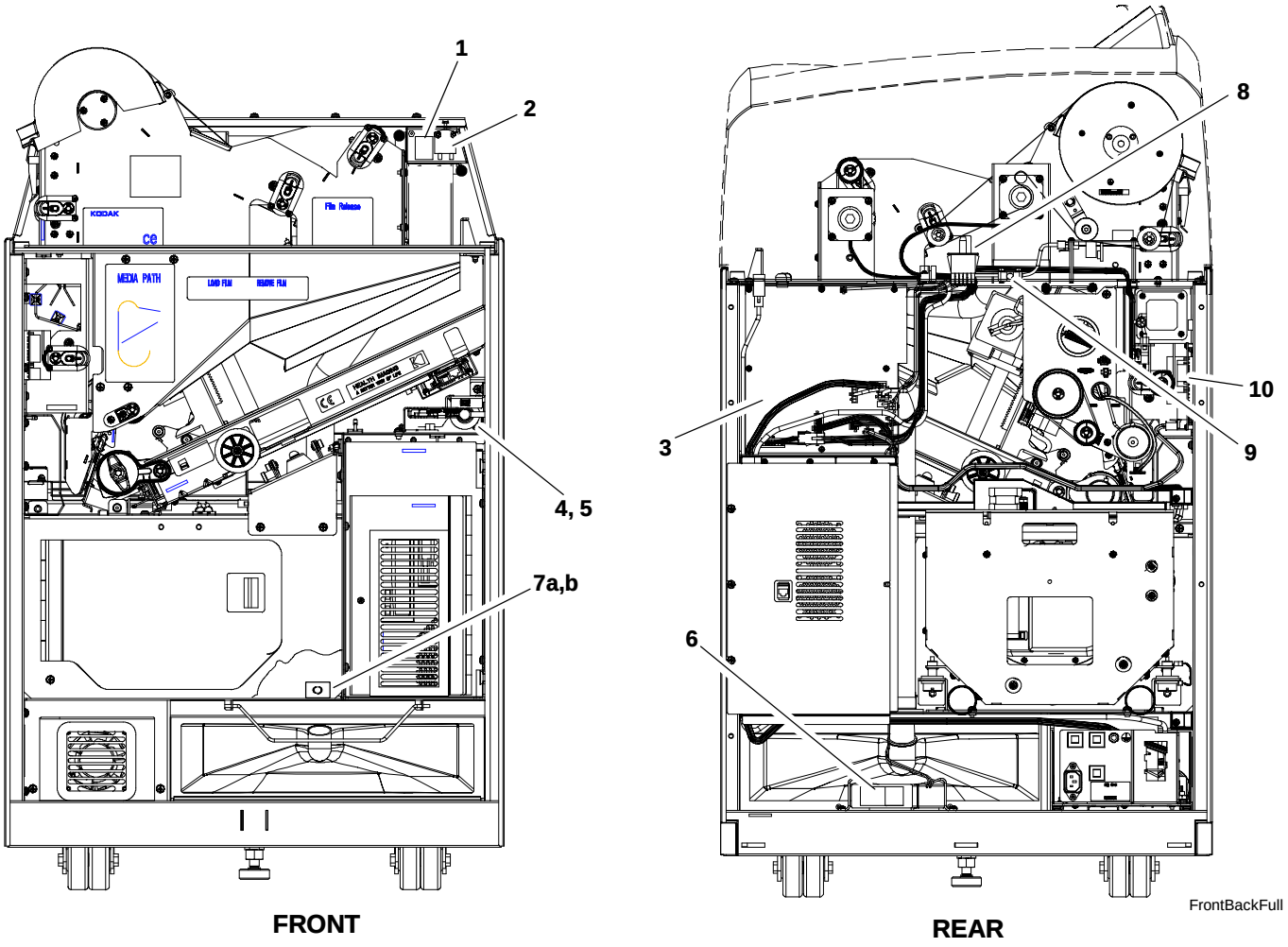
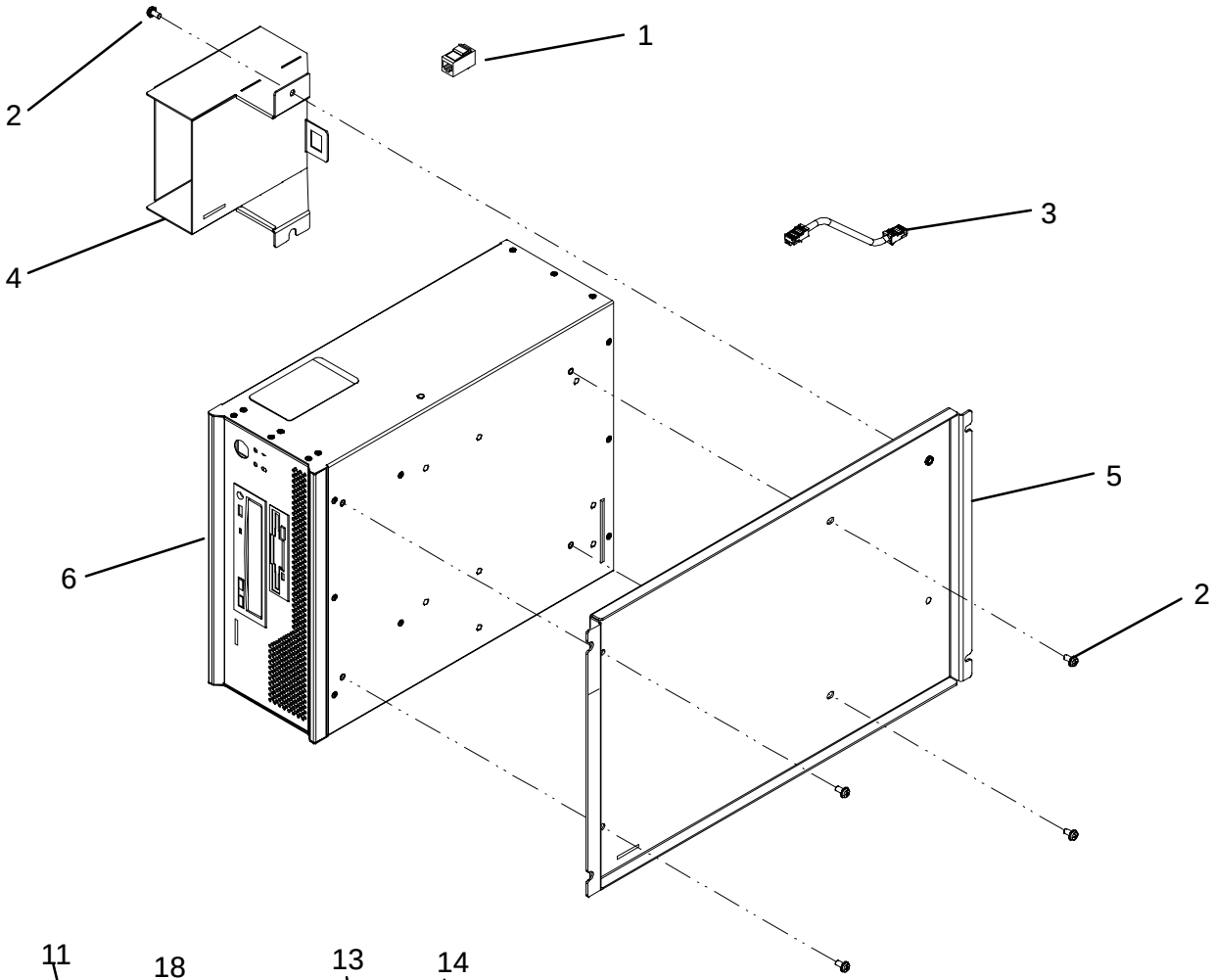


Figure 9-12. ELECTRONICS

Item No.	Part Number	Description	Qty
1	SP5E5849	SWITCH, Power	1
2	SP26-1011-6202-7	SWITCH, Top Hood	1
3	SP8E9983	BOARD, MCS	1
4	SP96-0000-2906-4	LATCH AND SOLENOID ASSEMBLY	1
5	SP96-0000-2506-2	CABLE, Door Solenoid	1
6	SP96-0000-5190-2	FAN, Charcoal Filter	1
7a	SP74-0401-7748-2	INTERLOCK, Front Door	1
7b	SP26-1011-6202-7	SWITCH, Front Door	1
8	SP943601	SWITCH, Service	1
9	SP26-1011-6202-7	SWITCH, Rear Panel	1
10	SP7F1152	BOARD, Feeder	1

Figure 9-13. DICOM RASTER ENGINE (DRE)



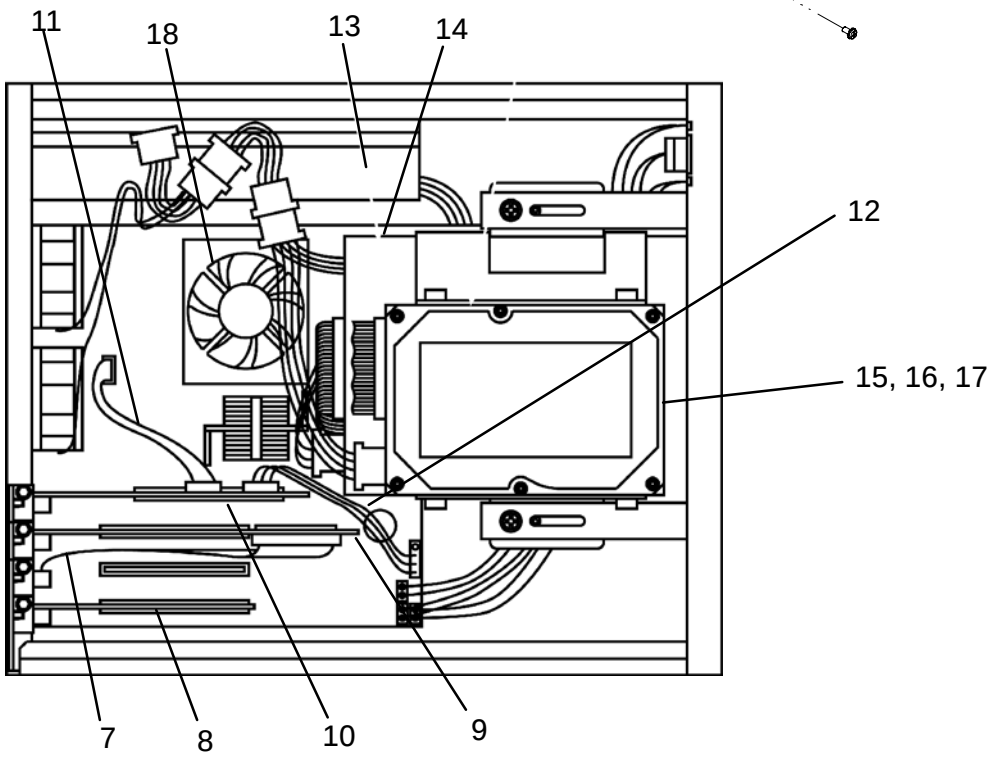


Figure 9-13. DICOM RASTER ENGINE (DRE)

Item No.	Part Number	Description	Qty
1	SP7E8814	CONNECTOR, L–Com	1
2	Not Available	SCREW, PAN, sems, M5 x 0.8 x 10	5
3	SP7F1117	CABLE, Ethernet Input	1
4	Not Available	DUCT, DRE	1
5	Not Available	BRACKET, Mount	1
6	SP7F1140	DRE AY – Includes items 7 through 18	1
7	SP7F1130	CABLE, PCIO Digital Output	1
8	SP5F2216	BOARD, Fast Ethernet, 3–Com	1
9	SP96–0000–4282–8	BOARD, PCIO	1
10	SP7F1133	BOARD, Local Panel Transmitter	1
11	SP7F6023	CABLE, Serial	1
12	SP7F6024	CABLE, Speaker	1
13	SP7E9764P	POWER SUPPLY	1
14		BOARD, Memory, SIMM	2
15	SP7E9781	HARD DRIVE	1
16		CD–ROM DRIVE	1
17		FLOPPY DRIVE	1
18		FAN	

Figure 9-14. INTERNAL CABLING

Item No.	Part Number	Description	Qty
1	SP7F1110	HARNESS, AC Power	1
2	Not Available	CABLE, Interlock, Front	1
3	Not Available	CABLE, Interlock, Rear	1
4	Not Available	CABLE, Interlock, Top	1
5	Not Available	CABLE, Service Switch	1
7	SP96–0000–2493–3	CABLE, Pickup, FCB	1
8	SP96–0000–2846–2	HARNESS, Pickup	1
9	SP96–0000–2401–6	HARNESS, Rollback, Elevator	1
10	Not Available	CABLE, Transport, S–MCS	1
11	Not Available	CABLE, Feeder, Power	1
12	SP96–0000–2492–5	HARNESS, FCB, Feed Roller	1
13	SP96–0000–2496–6	CABLE, Feeder, MicroComm	1
14	SP96–0000–2518–7	CABLE, Barcode, MicroComm	1
15	SP7F1114	HARNESS, Vertical Transport	1
16	SP7F3357	CABLE, Ribbon, DRE	1
17	SP7F1115	CABLE, PIB–MCS	1
18	SP96–0000–2864–5	CABLE, Ribbon, Platen Optics Module	1
19	SP7F1194	CABLE, Ribbon, MCS–Platen Optics	1
20	SP7F1104	HARNESS, MCS–Platen	1
21	SP7F1113	HARNESS, MDB–Power Supply	1
22	SP74–0401–9144–2	HARNESS, Rollback Sensor	1
23	SP96–0000–2874–4	HARNESS, Sensors, Platen	1
24	SP96–0000–5354–4	HARNESS, MCS–Cherokee Power Supply	1
25	SP96–0000–2510–4	CABLE, Densitometer, MicroComm	1
26	SP96–0000–2851–2	CABLE, Exit Sensor	1
27	SP7F1116	CABLE, MCS–RTD	1
28	Not Available	CABLE, Transport Sensor	1
29	SP7F1098	HARNESS, Power Mod	1
30	SP74–0401–9156–6	CABLE, Sensor, Vertical Transport	1
31	TL5576	NETWORK PATCH CABLE (straight–through)	1

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Section 10 – Diagrams

10-1. System Functional Diagrams

Block diagrams and wiring diagrams for the electronic components in the *Kodak DryView* 8150 LASER IMAGER are located on the Health Imaging Digital Output Service Collection CD set as a separate document. Look for “8150 Functional Diagrams”, document 7F6723.

There are 2 diagram sheets. The DICOM RASTER ENGINE (DRE) is shown on Sheet 1 and the Machine Control System (MCS) on Sheet 2.

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